The Builder.

VOL. XXXI.—No. 1599.

House Building and the Census.

IN our recent observations on this subject, we assumed that the average value of a house was 250*l*. Some practical correspondents are inclined to think that we have struck the average too low. There will possibly be others who will take the opposite view. It may, therefore, not be out of place if we mention here how we arrived at the above estimate. The average annual rental of a house was estimated in 1862 to be 15*l*. 10*s*., and its value was taken at a figure equal to fifteen years' purchase. This would make the average value of each house 232*l*. 10*s*. This was the estimate for the year 1862, and it was based on the data supplied by the House Census of 1861, and on the Returns of Assessments to the Inhabited House Duty. There can, however, be no doubt that the value of house property has greatly increased since 1862. It is a matter within every one's experience, and though it may be difficult, if not impossible, to determine the increase with exactness, yet if we only compare the number of houses of the assessed annual value of 20*l*. and upwards in 1862 and 1871, we shall find the clearest possible proof that the increase has been very considerable. In 1862 there were 519,991 houses assessed to the inhabited house duty. In the year 1871 the number had risen to 748,719,—an increase of 44 per cent. in this class of houses. Of the inhabited houses below 20*l*. rental there were in 1862 as many as 3,219,514, and in 1871 there were of the same class 3,510,398,—an increase of only 9 per cent. Hence, in the nine years' interval, while there was an increase of 44 per cent. in the better class of houses, the number of the lower class,— those below 20*l*. rental,— shows an increase of only 9 per cent., or little more than one-fifth the rate of increase in the class subject to duty. These figures plainly indicate the rapid development of the resources of this country between the last two censuses. They show that to every 100 houses paying a rental of 20*l*. and upwards in 1862, we had 144 of the same class in 1871. While of houses paying under 20*l*. rental, to every 100 in 1862 there were only 109 in 1871. To show, however, with mathematical nicety the precise increase which has taken place in the value of house property would require a series of calculations of too technical a nature to be discussed in this place; and for the exact facts on this point the public must wait until the issue of the final report on the results of the last census. But, for the purpose of arriving at some general idea of the amount of money expended in house-building, it will hardly appear extravagant if we assume that their value had gone up 7½ per cent. between 1862 and 1871, and that if a house cost on the average 232*l*. 10*s*. in 1862, it would be worth 250*l*. in 1871. Very probably this will turn out to be an under-estimate, and, since 1871, house property and house building have no doubt become still more costly. We prefer, however, to be within rather than beyond the mark in our estimate, and for the purpose we have in view in these remarks, we believe that 250*l*. may be taken as a sufficiently near approximation to the average value of houses in this country during the ten years 1861–1871.

We roughly estimated the number of houses built between those two dates at 988,683, and their value at 240 millions sterling (by an error in transcribing, this was wrongly given at 220 millions). The more exact value of them would be 247,170,750*l*. We are now prepared to pass to the final question we have proposed to ourselves, and shall endeavour to form some rough estimate of what the building interest may have to look forward to in the immediate future.

In any attempt to estimate the prospects of the building trades in coming years, there is one fact which must never be lost sight of, for on it all calculations of this nature must necessarily depend. We mean,—what must be obvious to every one who has interested himself in this subject,—that the building interest, more than any other branch of industry of similar extent, is directly affected by the general state of the commerce and trade of the country. A period of commercial depression is at once felt by the builder through his business falling off to a greater or smaller extent. In a time of commercial prosperity, on the other hand, when new enterprises are started every day, and the general trade and population are on the increase, builders as a body cannot fail to thrive. There are, in fact, few more unfailing signs of the commercial prosperity or depression of the country, than the prosperity or depression of the building interests; and as a rule we may say that if builders are generally thriving, the country on the whole is in a prosperous condition.

If we want to know, then, how the building interest may expect to fare in, say, the next ten years, it is of the first importance to ask what are the prospects of the country generally during that period. One great criterion in judging this question is to be found in the relative extent of our exports and imports in recent years. On referring to the Board of Trade returns* we find that the total value of our foreign trade increased from 377,117,522*l*. in 1861 to 547,338,070*l*. in 1870, being at the rate of 13*l*. per head of the population at the former date, and 17*l*. 11*s*. at the latter. Our foreign trade during those ten years was, therefore, increasing on the average at the rate of about 9*s*. per head of the population per annum. Now, if we compare the returns for the year 1872 with those of the year 1871, we shall find that our total imports and exports increased at the rate of 30*s*. per head of the population in the year's interval, the aggregate value being 669,282,458*l*. in 1872 as against 614,590,180*l*. in 1871. Between 1870 and 1871 the increase was at the rate of 40*s*. per head of the population. The average rate of increase during the past two years has, therefore, been 35*s*. per head of the population, which is equal to nearly four times the annual rate prevailing between 1861 and 1870, during which period, as shown above, the average annual increase was only 9*s*. per head.

The result we have so far arrived at, that the commercial prosperity of the country has been greater in the past two years than it was ever before, is confirmed by general experience. Never has there been so general a rise of wages among the working classes. Never has capital been invested more abundantly or in a greater variety of ways. But the momentous question comes,—is the unprecedented prosperity of the past two years likely to continue increasing at the same rate in the future? The question must, we think, be answered in the negative. The recent returns of the Board of Trade, more especially those just published, show a falling off in some of the most important branches in our home and foreign trade, especially in textile fabrics, coal, and iron manufactures. The returns of the banking clearing-house, and of the Bank of England also indicate a stationary or diminishing trade. Into the details of the question this is no place to enter; but it is the opinion of the soundest commercial authorities, that when the returns for 1873 are made up they will show that the trade of the country is in a less prosperous condition than it was last year, and that if there is any increase at all, it will be trifling as compared with the past two years. Respecting the causes of this check in our prosperity, nothing more need be said than that it appears to be mainly attributable to the enhanced cost in the most important of all the agents of production. We refer to the rise in the price of coal and the consequently increased cost of iron and of all machinery; that is, just those articles on which the commercial and industrial pre-eminence of England principally depends. It must not, however, be forgotten that this check in our prosperity, which is now every week more clearly showing itself, is only a check as compared with the two exceptional years 1871 and 1872. As compared with the previous ten years, 1861–1870, the general trade of the country is even now increasing with greater rapidity, and unless some unforeseen calamity occurs,—unless, for instance, coal, and therefore iron and machinery, become dearer instead of cheaper,—or unless we have a great war, a famine, or a succession of bad harvests, there appears every reason to anticipate that the prosperity of the country, and the consequent increase of its population, between the years 1871–1881, will be at least as great as it was between 1861–1871.

Assuming, then, that only the minimum of increase will prevail between the last and the next census, our population, which in 1871 amounted to 22,712,266, will in 1881 number 25,698,013, and the building trades will have had by that year to provide us with additional dwellings for 2,985,747 persons, or very nearly three millions of people. The number of persons to each house standing in England and Wales is a fraction over 5 (viz., 5·0204). It follows, therefore, that if this rate of distribution per house continue, the number of additional dwellings which will have to be erected between the years 1871 and 1881 will be 594,722. In addition to these there will be, roughly speaking, at least 10 per cent. of the houses standing in 1871 (viz., 4,520,462) requiring from various causes to be pulled down and rebuilt. Adding the 452,046 that will have to be rebuilt to the 594,722 required by the increased population, and we find that the total number of new houses that will be erected between 1871 and 1881 amounts to 1,046,768. Adopting 250*l*. as the approximate average cost of erecting a house, we shall find that the amount expended in this country between 1871 and 1881 on the building of dwelling-houses will be not less than 261,692,000*l*. as against 247,170,750*l*. between 1861 and 1871. During the ten years now passing we may therefore calculate that capital will be invested, in adding to our house property, at the rate of not less than 26,000,000*l*. a year, or half a million sterling a week.

It must be understood that the above figures are only offered as a rough estimate, and they are given with all reserve, and under the conditions above specified. House building, after all, includes but one portion of the work of the building trades. We have left out of consideration the larger portion of the field in which they have to operate. We have not touched on that large class of structures which are not dwelling-

* Statistical Abstract for the United Kingdom from 1858 to 1872. Eyre & Spottiswoode. 1873.

houses,—we mean churches, chapels, and school houses, public halls, shops, workshops, and factories; nor have we glanced at the greater enterprises, such as railways, docks, harbours, bridges, and canals, which occupy our large contractors, and which form the most striking feature of the present age, regarded from the standpoint of the builder and architect. With respect to these departments of the builder's sphere of action, there is only one observation which we feel impelled to make at this moment. If our population continue to increase in the period we have been contemplating, even if it be only at the minimum rate of progress on which we have based our calculations, then the number of houses to be built and the money expended upon them cannot be less than what we have estimated above. But if our prosperity be greater, and our population increase more rapidly, there will be a proportionately greater amount of building to be done, and more capital will be invested in this form. But the point we would finally call attention to is that what we have just said of dwelling-houses applies with equal force to all other species of erections, and all other works included in the building trades. For with every increase of population there will be an increase not only in the erection of houses, but also of every kind of uninhabited building,—churches, chapels, workshops, &c., as above specified;—and the same may be said of the other class of works which we have mentioned,—the railways, docks, bridges, harbours, and canals.

THE PROPOSED TUNNEL UNDER THE RIVER HUMBER.

ENGINEERING EVIDENCE ON SUB-MARINE BUILDING.

DURING the late Parliamentary session one of the most protracted inquiries into private Bills was that in connexion with the proposal to construct a tunnel under the river Humber, near Hull, one mile and five-eighths in length, upon the pneumatic principle. The tunnel was to form a portion of a new projected line of railway, thirty-one miles in length, called the Hull South and West Junction Railway, promoted mainly by the merchants and trading interests of Hull, supported by the corporation, the local marine board, and other local authorities. The chief oponents of the project were the North-Eastern Railway Company, which is the only company at present having a railway and station at Hull. After a hard fight, which lasted for upwards of a fortnight, the Bill received the sanction of the Committee of the House of Commons, but was defeated after an equally prolonged and severe struggle before the Lords' Committee. We understand that the promoters of the measure intend to renew their application next session, the construction of the proposed railway and tunnel having already been affirmed by the House of Commons. The important engineering evidence already given as to the projected tunnel, which is of an entirely novel character, is therefore now invested with a special interest, so far as it has reference to submarine construction and building.

The several engineers who gave evidence on either side, as to the merits or otherwise of the projected tunnel, included some of the most eminent in the profession, Mr. John Fowler, the engineer of the proposed line, and the designer of the tunnel; Mr. J. J. Bramwell, vice-president of the Institution of Mechanical Engineers; Mr. James Abernethy; Mr. Thomas Hawksley, president of the Association of Civil Engineers; Mr. James Brunlees; Sir John Hawkshaw; Mr. G. P. Bidder; Mr. T. E. Harrison, engineer to the North-Eastern Railway Company; Mr. John Dixon, mechanical engineer; Mr. Thomas Clark, artesian well engineer; &c. These gentlemen must be allowed to tell their own story.

According to the statement of Mr. John Fowler, C.E., he proposes to cross under the Humber at Hessle, near Hull, the tunnel emerging on the other side of the river, at Barton, in Lincolnshire. The total length from shore to shore is 2,840 yards, or nearly a mile and three-quarters in extent. The crown of the tunnel will be about 10 ft. below the bed of the river, and as it will have to pass entirely through sand, it will not be possible to tunnel by the ordinary process of excavating and mining. In carrying out the works he therefore proposes to adopt the pneumatic process as follows:—Three working vessels are to be provided, the dimensions of each to be 160 ft. in length, by 42 ft. in width, and 23 ft. in depth. The upper half will consist of pontoons, and the lower half of a working chamber, or diving-bell. This working vessel will suffice for the construction of 160 ft. in length of a double tunnel in one section. The process will be first to moor the working vessel in the river over the site of the tunnel; secondly, to sink it to the bed of the river by the admission of water into the pontoon; thirdly, to expel the water from the lower portion or diving-bell by forcing in air, and this having been effected, workmen will enter the chamber, and excavate the ground for the 160 ft. length of tunnel. When the working vessel has been sunk through the material of the bed of the river to the depth of the inlet of the proposed tunnel, bricklayers will enter and commence to build the tunnel. When this portion is complete, the working vessel will be withdrawn and again sunk at another spot, in the manner already described, when a further length of the tunnel will be proceeded with as before. The joining together of the isolated lengths of the tunnel will be effected as the working vessel is being gradually withdrawn from the bed of the river. The machinery for supplying the required air, and the pressure to keep the diving-bell portion of the apparatus free of water, will be erected on a deck or table carried a sufficient height above the working vessel to be above the level of high water when the working vessel is in its lowest position. The excavations will consist chiefly of sand, which will be removed by sand-pumps worked by the compressed air in the diving-bell. The bricks and other materials will be lowered by machinery, from the stage or deck already referred to, into the working chamber below. The two inner rings of the tunnel will be of blue Staffordshire brick, set in the best cement. Mr. Fowler adds, that knowing all the conditions of the pneumatic system of construction, he was confident of being able to make the tunnel perfectly water-tight and safe. He also states that he has been connected with the construction of many works on the pneumatic principle, none of which have failed, and that the process is a certainty. As far as the work of excavating and brick-building is concerned, it is very much like an ordinary operation in the open air, except that the workmen are artificially supplied with air. The cost of making the tunnel he estimates at 343,000*l*., which, at 2,840 yards, would be 120*l*. a yard.

Mr. Frederick Joseph Bramwell, C.E., said he had carefully examined Mr. Fowler's plan, and was confident that the tunnel could be easily and safely made according to them, and for the sum named in his estimate. He added, "I have considered very carefully the nature of the vessels proposed by Mr. Fowler, and the mode of using them, and I have not the slightest doubt that by them the tunnel can be successfully carried out. There will be no difficulty in supplying the chambers with air in order to enable the men to work. The thickness of the brickwork is amply sufficient to resist any pressure that could be possibly brought either laterally or on the surface. I believe it would not really crush under 900 ft. of pressure. The surface of the bed of the river is so far below high water mark that the working vessel or pontoon would be floated over any part of it where it is proposed to make the tunnel, except quite close to the banks."

Mr. James Abernethy, C.E., said that the pneumatic plan which Mr. Fowler proposed to adopt for the purpose of making the tunnel was, he thought, the very best plan he could adopt, and he also thought it was a plan that involved no risk. There would be no difficulty in joining the lengths of brick in the water. He saw no difficulty in forming the junction. It was a mere question of setting the bricks in about 6 in. of quiescent water. It was a common practice, and done every day. He had underpinned culverts under water. He had also constructed a very large culvert, 8 ft. 6 in. in diameter, where they were constantly under water. They never could keep it dry, but they had no difficulty in making a substantial job of it. In cross-examination by the counsel for the opponents of the Bill, Mr. Abernethy said that as far as joining the lengths of the proposed tunnel under water, it was new, and had, he believed, never been done before; but that it could be done and done easily he was quite confident. He thought the construction of brickwork within the air-chamber or diving-bell was quite as easy as constructing brickwork in the open air. He put a little higher price on it, but it was as easy to construct a tunnel 60 ft. or 70 ft. under water, within an air chamber, as it was to construct it in the open air.

Mr. James Brunlees, C.E., said he had had a large experience in the construction of railway-viaducts and embankments, particularly in connexion with tidal rivers, and he saw no difficulty in carrying out the tunnel as projected by Mr. Fowler. He had taken into consideration the depth of the water, and the passing of the tunnel below the bed of the river, and also the nature of the material forming the bed of the river. He had constructed several tunnels through various strata, and was now engineer for the Mersey tunnel. He was also in consultation with Sir John Hawkshaw, the engineer of the proposed tunnel under the Channel from Dover to Calais, and was also joint-engineer with him to that scheme. He did not think there would be any difficulty in bringing the pontoons over the exact site of the tunnel proposed to be constructed. Neither did he think there would be any difficulty in joining the lengths of the tunnel. There would, no doubt, be a little water in the bottom; but it was not at all an unusual thing to lay bricks in water to a certain extent. In cross-examination, he said no work like that had ever been done for a tunnel, but it had been done in foundations. The nearest thing to Mr. Fowler's proposal that he knew of was the foundations of a bridge in New York, which was a very good example.

Mr. Denison (counsel for the opponents).—You would hardly suggest that the foundation of a bridge is at all equivalent to a tunnel, which is a pipe, and has to be made in pieces, and joined?

Mr. Brunlees.—I do not apprehend the slightest difficulty. I have not the slightest doubt about Mr. Fowler carrying out the tunnel. Not the slightest. I have been carefully going through it with him. I have not had any tunnel-construction analogous to this. The tunnel under the Mersey is the nearest.

Mr. Thomas Hawksley, C.E., said he had informed himself of the local conditions under which it was proposed to construct this tunnel, and had visited Hull on the subject. He had carefully considered Mr. Fowler's plan for constructing this tunnel across the Humber. The principle was a common diving-bell of enormous size. He really did not see, after carefully considering the subject very attentively, that the difficulties in making the junctions would be considerable. In his opinion it would be easy to make the junctions by interposing clay-bags between the ends of the caisson and the stopping-wall which was intended to be built up. When a caisson was moved, and had to be resunk, it was the easiest thing in the world to cut through these clay-bags by the sharp edge of the caisson, and so effect the sinking without allowing the sand to come into the space between the end of the caisson and the end of the chamber. Complete watertight works could be effected under water. They sometimes performed that operation by means of a pump. They get very fine-sifted Portland cement, and sometimes, if they wanted the setting operation to be very rapid, they used Roman cement instead of Portland, and this fine cement was pumped through a tube, so as to be kept out of contact with the water in the neighbourhood. It then went down exactly into the place where they wanted it, and the brick was set by it at once.

In cross-examination by Mr. Bidder, Q.C. (son of the engineer), Mr. Hawksley said, that this being a new work in some respects, experience would be gained. There would be a good many little accidents and little difficulties which would have to be remedied and overcome.

Mr. Bidder.—You admit, then, that there would be difficulties to be overcome?

Mr. Hawksley.—That is the function of the engineer. We would be of very little use if there were no difficulties to overcome.

Mr. Bidder.—You do not deny that the making of these junctions in the tunnel would be difficult?

Mr. Hawksley.—What I say is, that the building in of the junctions would no doubt be troublesome, but not difficult.

Mr. Bidder.—You are refining, I am afraid, Mr. Hawksley.

Mr. Hawksley.—No; there is a great difference between troubles and difficulties.

The foregoing was the engineering evidence in support of the project for constructing the tunnel. In opposition:—

Mr. T. E. Harrison, C.E., engineer to the North-Eastern Railway, was examined at considerable length by the counsel for the oppo-

nents of the Bill, and in the course of his evidence he admitted that the tunnel might be made on the pneumatic principle, as proposed by Mr. Fowler, but that in his opinion the joints of the tunnel could not be made water-tight, which he regarded as a serious if not fatal objection to the scheme. He also expressed an opinion to the effect that there would be greater difficulty than Mr. Fowler imagined in placing the pontoons. He thought it was a matter of strong doubt whether Mr. Fowler would be able to do it without making a proper staging, which he (Mr. Harrison) had invariably made whenever he had to put down cylinders by pneumatic pressure.

Sir John Hawkshaw, C.E., said he was Consulting Engineer to the Hull Docks, and built their new docks. He had had great experience in building under water for many years. He could see no difficulty in building within a caisson or large diving-bell in constructing a tunnel, because it had been done in various other places, but he did see very great difficulties, and he did not think it would be practicable, to make a secure connexion between the work built inside the caisson and the work outside. He might state that that was not an opinion arrived at in reference to this case at all. He was now constructing a tunnel through the London Docks, and he thought at one time of doing it in the way proposed by Mr. Fowler. He arrived at the conclusion that there would not be a difficulty in constructing the tunnel in the way proposed by Mr. Fowler, and by such an apparatus, but he dared not venture to make the connexion between the work constructed inside and that constructed outside, and therefore he abandoned that method. He did so because it appeared to him that it would be quite impossible to secure water-tight joints, and if he did not secure water-tight joints then he did not see any practical way of making them water-tight afterwards. He was not there to say that they could not sink a caisson in the Humber, and that they could not within it build the portion of work which the caisson was capacious enough to hold, but he did not see how they could make the junction in such a way that it could shut out the water from the Humber. He had not formed any opinion of what the proposed tunnel would cost, because he did not believe Mr. Fowler's plan was practicable. Mr. Fowler's estimate was 120*l.* per yard, whereas his work across the London Docks was let at 209*l.* per yard, and it was not so deep as Mr. Fowler's tunnel. He would not advise any contractor to undertake it at the sum set down by Mr. Fowler, and he would not undertake it himself.

Mr. G. P. Bidder, C.E., who was emphatically pronounced in his condemnation of the project, said, in his examination, that he had the same difficulty as Sir John Hawkshaw as to water-tight junctions, or rather water-tight closures. He knew of no instance where it had been effected. As regarded the pontoons in Mr. Fowler's plan, he did not think that they could be kept in their place considering the current in the Humber. He did not think that Mr. Fowler's mode of making the tunnel was one which he should be inclined to adopt. He certainly would not be responsible for it. In cross-examination by Mr. Venables, counsel for the promoters, Mr. Bidder said it was totally impossible to bore under the Humber.

Mr. Venables.—Then it seems to me, according to your theory, that it is impossible to have a tunel under the Humber at all.

Mr. Bidder.—"My belief is, I am bound to tell you, that passing the preamble of this Bill will have no more practical effect in getting a tunnel under the Humber than if you were to pass the preamble of a railway to the moon. There would be no difficulty in getting under the Humber if you found suitable material. If you found clay there would be no difficulty in getting under the Humber. I do not know how the water-tight joints are to be made. I have had a great deal of experience in my railway days, having attended personally to the making of good sound water-tight brickwork under water strata, but I never succeeded to my satisfaction in making sound brickwork either in cement or anything else. This work possesses so many difficulties and contingencies to my mind that to attempt anything like a detailed estimate would be a solemn farce." Being asked if, taking the whole scheme into consideration, he thought it was one which ought to recommend itself for practical adoption, he replied, "It may recommend itself in any shape you like, but there is nothing practical in it."

Such was the evidence of some of the most distinguished engineers of the day, for and against a project which was twenty-eight days before the committees of the Lords and Commons last session, and which is again intended to be fought out when Parliament meets next year.

PROFESSOR WILLIAMSON'S SCIENCE, AND A GLANCE AT ART.

IT will certainly be impossible for the youthhood of this present age to complain in the future,—that the question of its *education* has not been well looked after and thought about by those who went through life before it. Not a week, hardly a day, passes but some notable man or other is found stepping to the front and discoursing, not a little ingeniously sometimes, on the all-absorbing and comprehensive subject of "education." How best and most usefully to educate the rising generation,—that is now the question of questions, both here and pretty nearly everywhere else all the civilised world over. Each year the British Association for the Advancement of Science does a little towards this end, and in the present year of grace, Professor Williamson comes forward with a thoroughly scientific thought about it, and with an array of proofs in its favour which evidently cannot be gainsaid. The learned and earnest Professor builds on a right solid foundation. "Our very ideas," he says, "are useful only so far as they are *true*, and he must, indeed, be blind to interest and to duty who could wish to swerve from the path of truth." None will surely dispute this. Each student of nature, he contends, and searcher after truth, should be placed in such circumstances as shall be most favourable to efficient activity, and that the desire of such students for the acquisition of knowledge may be kept alive and fostered. Theoretical and experimental *chemistry* is of those sciences which most "enlarge and exercise" the mind of man, and he urges a public school of chemistry, and an organisation for the finding out who are most naturally and educationally fit for it. It would cost "just three iron-clads" a year to do this work of the finding out who, among our millions, are natural-born chemists and who are not. We must confine ourselves to fine-art matters and to architecture, and to those things educational which appertain to them. What would be said in fine-art circles if such a proposition as this were to be made,—to find out who they are, at the cost of "three iron-clads," who best shall manifest an artistic faculty of both a contemplative and a practical order. What, we may ask in some curiosity, would the Royal Institute say to such an idea as this?

But does not this proposition of the chemical professor naturally lead one to think a little as to what "education," both scientific and artistic, really and truly is; and whence it naturally springs, and what it naturally and most usefully leads to. In the first place, is not the all prevailing idea of education, whether scientific or artistic, somewhat artificial and stilted? We will venture to affirm that without a finding-out apparatus of any sort or kind, whether expensive or not, that all those who possess any strong native faculty for any one art or science, will find it out for themselves. It is, indeed, wonderful to witness how through hosts of difficulties and hindrances some will be found to follow up any certain pursuit. They seem to pick up their knowledge, and practical skill, by a sort of divine instinct; and the very first real difficulty they find is,—not, how or in what way to acquire more knowledge, but how to put into useful and profitable practice the knowledge they have at so great cost and perseverance acquired.

The learned Professor's idea, be it observed, in this clever address, is to urge the establishment of what may truly be called a "national system" of scientific, if not pure chemical instruction, and for the advancement of science, the scientific education even of children, for the better supply of teachers of it, and thus eventually to lead the way to *original* research. He does not propose to do things by halves,—nothing less than a national system suffices him, and the direct action of Government itself: for he contends that the only question to be considered is, how the action of Government can be so "systematised" as to give free play to the natural forces which have eventually to do the work. It is really quite curious to read all the Professor's enthusiastic educational talk, and then to think for a moment how things really are, and what a tremendous task it is in real practice to go to work and have to do with a school of any kind, and with pupils of *any* sort. We have had to do with workmen in this way, and sure we are that none but those who have tried it can know how hard a thing it is. As Cobden once said, nothing is so hard as to *help* a man. To teach any one by any sort of compulsion in any way is simply to throw away both time and capacity and money. To leave the door open is pretty nearly all you can well do. It is for the willing and earnest pupil to *learn* from the open books before him. In our own efforts we never found it avail to compel the student, and hardly,—and this is of no slight importance,—to lead him; the natural leanings and inherent faculties of the student must do the work in the main, if it is to be done with a practical end in view. The "conditions," as the Professor puts it, must first of all be "appreciated" by the pupil. Nothing can be truer.

May we not here, then, throw out a hint or two educational from an architectural point of view? To our minds, there can be no greater delusion than to suppose that any one trade, or business, or profession, can be thoroughly and adequately learned in any school, or academy, or college, however well it may be managed. It is, in reality, only in a shop, or warehouse, or *office*, that a competent and *practically* profitable knowledge of anything can be got at. Let any one consider what time in years it takes of daily routine practice to get a knowledge of architectural drawing, to master details of architecture, and to attain any competent knowledge of constructional art to found them on. Day after day, and year after year, is it required of the architectural pupil to get a practical and useful knowledge of "office" work only, to say nothing of much that is far higher, but which can alone become useful by a competent knowledge of the dull foundational work. The foundation of a house is not more necessary to the building of the house, and to its after security, than is the daily dull routine of the office to the future practice of the working architect. No amateur working, or method of work, no fancy practice, or playing at architecture, or building, can take the place of the real, and daily, and useful, professional work. It is the same in all things connected, however remotely, with architecture. There is no royal road to them; no easy learning the art and the practice of architecture in "six lessons." It is really wonderful to think how every man will acknowledge this truism in his own special business, but will, in most cases, never more than half allow its truth in anything he knows but little or nothing of.

One of the most notable thoughts in the Professor's earnest address was on the subject of a better supply of *teachers* of science; and may we not add, of art too, for the remarks he made apply as forcibly to the one as to the other? The thing most needed, he contended, at the present time for the advancement of science,—and art, we add,—is a supply of *teachers* devoted to the object, men so earnest after more and more knowledge as to be "model students." These are to inspire the younger investigators, and these again, as he continues enthusiastically, will and must in each succeeding age go on improving, getting more and more learned, and with a deeper insight into the mysteries of the speciality each one may take to. Their whole lives will be devoted to the extension of the domain of truth, and their highest reward the consciousness that their exertions have benefited their fellows, and been appreciated by them. What, indeed, can be better, and it is only to be earnestly hoped that, in the future if not in the present, the public mind generally will come to see this both in science and art, and that it will come to see as well that none can live on simple enthusiasm, however intense and however earnest. No one can fail to admire these fine and enthusiastic thoughts and longings, but we live in a world of business, and while these simple-hearted things are being thought out by retired students, thinking of nought but their noble work, it is to be feared that the outer world, unless well looked after, and perpetually reminded of it, may forget that the labourer is always worthy of his hire. *Thought* as well as work is worth the paying for sometimes.

There are, too, in this address, not a few able remarks on the value of teaching. No known conditions are so well calculated to give a young investigator the closest and strongest grasp of his special subject as those in which he is placed

when thus engaged in earnestly teaching in a college. There is, Professor Williamson contends, nothing like it in its effect in preparing and fitting the mind for original research. Of this there can be no doubt; for in the effort to make a thing clear to others it becomes clearer to yourself. But even here we must not exaggerate or make too much out of a little. It is quite certain, as we take it, that as much, if not more, depends on the student as on the master. A capable pupil gets on almost without a master's assistance. He learns almost unconsciously, and gets sometimes ahead of his preceptor. No power of teaching can create faculty in a stupid pupil, or elicit brightness out of dulness. It points out the road, but it is the pupil who must himself get profit by looking out before him, and to right and left, as he goes along. Art and science are here on equal terms. No master of a craft can take the hammer out of the student-workman's hand and strike for him, for that is to change the character and authorship of the work. He can but look on and give him friendly hints in true tones of encouragement, pointing to other noble work, and commending, may be, when a good and clever blow is struck. But the actual work must be the pupil's own, and nothing else.

By way of illustration, and to show how deep is the well of modern knowledge, though we must not here grow too scientific or speculative, we may mention there are not a few items in the Professor's address which are calculated to rouse not a few thoughts as to the ultimate nature of things. We can but say a word in parenthesis. *Art* is sometimes, not a little unfairly as we think, accused of indefiniteness, and positive doubtfulness, or even worse, —confusion dire itself; but what can be more obscure and hidden from mortal gaze and measurement than *atoms?* Ultimate indivisible atoms are mysterious enough, that is certain; so are they if infinitely divisible. Hard for the poor student to get a notion of, but still harder for the *master*, who sees more of the difficulty of it. What, then, can be the nature of that mighty influence or "force" which keeps these together, with so tight a grip, as in the diamond, or in hardened steel? Hard things these to get a clear idea of,—quite as hard and insoluble as in any difficult problem in art, full of contradictions, as it no doubt is, and of profound difficulties. Nothing seems, at first sight and superficial glancing at, to be more certain and understandable than these marvels of science, and they seem to have no small advantage over artistic speculations; but not so, for the deeper we look the more the difficul y. Where angels fear to tread, there, indeed, it is that the short-sighted go boldly in. Toleration, indeed, that habit of mind, as the president so well urged, is necessary here. It is, he said, one of the most hopeful indications of the moral improvement of man in these latter days. Here all will allow it to be needful, both in science and art.

THE FACULTY OF SUCCESS.

WHAT comfort to give tongue of our secret griefs to a sympathising or helpful confidant or confessor,—the burden lighter now the knowledge of it is shared! Not alien from the pleasure of airing cherished crotchets, or drawing the shade from gleams of insight, and other disburdening of spirit,—the sharer therein being a nearest intimate or perfect (*i. e.* not obviously evil) stranger. Who shall add a fresh word on the topic,—give a fresh turn to a conclusion so thoroughly accepted? True by all confession, almost to yawning-point, when enunciated; fitter in condensed form for copy-headings or other device for extracting, volatilising, the sapor of a sentiment, than for the well-relished speech of the world. And yet,—the new forms, the ever-renewed youth, the sense of first freshness,—the triteness all in the moral and not in the tale. Why should the drama not be inexhaustible, although the passions have been named and tabulated? Why should not "A Carpenter" write to us from Dumbarton (on "The Gain of Technical Education," p. 751, *ante*), and expect, and get, us to understand and be obliged to him, and not unwilling to print his letter? And more than that, shall he not receive from us, and from many a reader too, respect for a hard head and its successes, and regret for his failures; and, after all, only the particle of advice that the unangered feel a merit in shortening for their well-cholered friends?

Should we be perilling too much credit for such goodwill, running risk at the same time of being deemed inditer of essays concerning the "praise of incompetency," if, drawing on no ill-stored memory, we let our first placid comment take the form of a hint as to the rarity of omniscience? "A Carpenter," who has given good study to (1) building construction, (2) mathematics, (3) applied mechanics, and not neglected to look into theoretical mechanics, complains that he has not been promoted to the rule of men; that, striving thereafter, he has met with rebuffs; that, as yet, he has not won over the guarding dragons to admitting him into the happy gardens, where hard hand-work as a task is out of fashion,—where his useful training will make smoother for him the way of life. Who would speak lightly of the instinctive gravitation towards command,—the current of tendency that leads the efficient mind and spirit to desire to lend its capacities to the work of good governance,—to guide with mind and will, fashioned by nature and by culture, the less gifted or less self-mastering of their fellows? We, least of all, who see how much there goes to the making of the true "king of men." Not to speak of the ideal creature,—the perfection of the ruler—who sways not only minds by the force of his own, but rules equally all the sentiments:—we would show reverence also to all his working substitutes who do their endeavour,—who are bearers of serviceable light, although no universe-gilding sun strikes from them his penetrating beam. Who will not, that has a memory of such matters, fancy (and, of course, almost every one will be in error) that he should know X——, the worthy and responsible contractor? and recognise his form, now a little rotund, but yet full of activity,—he is still a good ten years short of his grand climacteric;——as well as his face, in which may be seen the shrewdness and decision, veiled by a wise reticence, that appear in his letters, his acts, his self-justifications,—his claims for extras and his manful struggle to maintain them——his personal visits to distant quarries or brick-yards, undertaken seemingly on the spur of the moment, and as stimulating as if that figure had in sharpest steel materialised itself upon his tongue? Cannot memory trace him back, a good tale of years,—and identify him with X——, the general foreman? No genius in truth,—as all who strove with his work could testify. Science absent; delicate interpretation of drawings not present; setting out,—wanting looking after. But the X—— of to-day was there nevertheless! His then lithe form rested not, and he knew well when men were well placed and working to advantage. When did the work wait for materials?—and when did not times fit together happily to keep the staff all active? Were not the men of every arm so far his friends that they looked for "a straight bit of a work" as a chance to show him that their hands (and feet too) had not lost the powers they had of yore,—in former struggles under his leadership with time and nature? To arrange with him a modification of procedure, a temporary arrangement for occupation, to explain a drawing,—albeit, candour requires one to say that memory was frailer than comfortable:—— none of these was much of a task.

Who, looking in fancy or in fact at the X—— of to-day, can forbear to think a smile in seeing how faintly the acquired phlegm and self-reliance suggest the agitation that in those years made —on odd desperate occasions—the burden of life very heavy?—when the evidence of mistake,—or the gloom, projected from coming difficulties, actually almost succeeded in winning for an instant a breaking voice or a moistening eye? The merit of toughness among others was yet wanting. Yet—considering that he got about him good foremen of trades,—would one if called on by some ruthless hypercritic to choose—to say which side kicked the beam,—have parted with this phase of good service, and given more honour to Y——?

An intelligent draughtsman, a careful director of workmen, an admirable interpreter of drawings and instructions,—why did the works under his charge so linger, and the reproofs brought upon him therefor seem to make a fixed scowl a weekly tenant of his naturally good-humoured face? Was his non-success—or incapacity—"to push the job" a merit over which architects might have shouted praise,—for holding manfully aloft a worthy but too often despised banner inscribed with the legend,—of "good work slowly done"? Peace be with him!—nobody would say so.

And are no over-estimates made in respect of nerves not yet tested—or tested in other exercises,—or in respect of the capacity for prompt seizing of the moment and method of right action in difficult conjunctures. What?——to disclose in parable a secret of the prison-house——What fortuitous compulsion by minor influences drove Mr. Alaric,—one of the well-known leaders of the wolfish Gothic school—his manner as nervous as his drawing—into the witness-box on a question of characteristic geniality in respect of the dilapidations of a rectory-house?——It will be seen we are speaking of years well agone,—but few such questions will reach the sacred fount of justice (and expense), it is to be feared in future——. And what evil impulse led him under the gentle suasion of Mr. Coax, Q.C., to state publicly his practice to claim for internal decorations,—temporarily oblivious of masses of judge-made law; and still further to flounder when asked to explain the items so gracefully set down by his painstaking helper and coach,—who dreamt not so naturally as he of short columns and machicolations, and laid no claim to the awful powers of his discomfited and afterwards indignant coadjutor. In this connexion,—might not Edinburgh-Review-Jeffrey's innocent explanation of "effectual calling"—shocking as it was to the ears of his parish pastor, and for the nonce catechist,—be looked on as not out of point? Who of mortals is wise all day and every day?

But why test the thin thread—of argument by suggestion—with illustration to the destruction of elasticity? Still might not something be said in somewhat similar strain "of things passed as work that were really not work at all"?—"The men have cursed the job two or three times at least," said the troubled foreman, in the woe of his heart; when the limits of possible outlay, and the necessity of self-restraint in the impulse towards thoroughness,—in a work not under a lump-sum contract,—were pressed on his attention. All honour to the sentiment of the workman,—the longing after well-doing, even though the language would need the introduction of the —— in these columns, if reproduced in its genuineness, instead of in tolerated translation! But (say) 1,000*l.* were allowed by the decision of the powerful as an outlay;—what eager impulses could stretch its non-elastic purchasing power? Who is to judge, if not the paid and appointed officer?—and why need the workman who can do anything likely to be required of him grudge his service for what now happens to be wanted?

Not that one need be credited,—as the result of this,—with shut eyes and a ludicrous resolution to speak only fair things of whatever exists, or is customary. Truth to tell, any statement that things seemingly imperfect may have their soul of goodness is liable to be read with an odd twist of meaning. We are forced to confess that there are needy and ill-intentioned contractors, venal and blundering foremen, ill-instructed and torpid workmen, and architects and employers worried with their own cares, or, sad to say, not perfect in temper, or endowed with other ailments. Yet,—the reader knows the rest.

The moral implied by "A Carpenter" would —if put into form by an intelligent *précis*-writer—stand seemingly thus:—If you work with your head, and come to know your trade well, and more things besides, you will have less well-being in your lot in life. Worst of all, when your faculties have been sharpened, your skin will grow thinner in the process. Of course, by the way, such a writer of *précis*, being a mere machine, would not stay to point out the compensating advantages in many an instance of some attenuation of that integument!

It has yet to be proved that the tendency unduly to depreciate, is much more judicious than the habit unduly to bepraise, manual labour as the means of getting a livelihood. It, as we all know, has its drawbacks and its solid advantages. No one can deny that the pursuits that require the agile mind and powerful will call into play finer things than the muscles,—or even than the power of endurance and the moral qualities that go to any hard labour done with a will. Still less would perversity itself deny that the extension of the empire of man over his own life, over nature,—the compelling of fate, the strife with elemental powers, are in themselves the sternest and at the same time most useful discipline;—that the world, in fact, is the arena of all others fitted to afford play for the once-aroused activities of its owner. Also that—in proportion to the conquests—the worlds to be conquered extend; and besides, by the rules of the warfare, the new acquirements are divided (it may

be roughly, and after years of waiting it is true), — "as his part is that goeth to the battle, so shall his part be that tarrieth by the stuff." And all the while that the result of culture, its bright success in what seems its ultimate aim — the enriching of human life,—may seem thus to leave lesser labours in gloom, those labours have their own vindication and satisfactions. From Virgil to Carlyle;—of the "too fortunate husbandman," —only ignorant of his happiness in the sense of not being able to compare with full knowledge his lot with that of others—sings the sage of old time;—the worker of any sort who puts his soul into the effort, realises the monkish "*laborare est orare*," says the teacher of to-day.

It being always understood that the worker is fit for the work,—not the least of the difficulties in this world being to secure that he shall be. Apart from, and, of conrse a little in advance of, the plea for education as in aid of police, comes the plea that it sifts a nation; and—affording an opportunity to the capable—should, if judiciously regulated, secure the largest possible number of valuable men, well trained and fitted for the direction of others; —at the same time making the directed understand the words of command, and the reasons why they should be given. Parliament, even, has not yet succeeded in getting much further than "police." It hits the tone of the assembly, which for the most part views only the practical,—*i.e.*, the nearest, most obvious,—gains.

But we need not all of us imitate the wisdom (or shrewdness) of the Commons, and leave entirely unsaid the part usually relegated among the silences,—the third,—which in fact includes all other pleas for useful and thorough training. The voice of statistics, the questions of expediency, the arguments of governors in favour of securing the really able on the side of order and rule,—all these subside, almost as voices swallowed in the thunder, when the strong, manly tones of Milton sound across nearly half a score generations,—in all their earliest power, to those who can interpret their true meaning into the language of to-day:—"The end, then, of learning is to repair the ruins of our first parents by regaining to know God aright, and out of that knowledge to love him, to imitate him, to be like him, as we may the nearest, by possessing our souls of true virtue, which being united to the heavenly grace of faith, makes up the highest perfection." This appeal to each for himself, — for his own sake—that one does not feel shamefacedness to make in the words of a master, — is to be taken as understood in all our appeals for general and technical culture. Society, — to come down again to our best-loved conversational tone,—is a joint-stock concern, a co-operative society, which improves in proportion as each partner makes himself more efficient. Things would seem in a bad way if we concluded that nobody valued capacity and worth, because they are at times not recognised beneath disfigurements. They would be in a very bad way if the majority of people were not able to see and value them at all. But things will always be hopeful while the healthful natures, or the contagion of example, or other sufficiently potent influences, constrain enough of us "to labour—and to wait." Will "A Carpenter" forgive us for being led by him into so long and strange a homily? Reciting some old sayings that, in moments of pique, or of overstrained patience, he,—like the rest of us for afew instants at times,—is mortal enough to deny their usual influence.

PICKINGS AT THE BRADFORD MEETING OF THE BRITISH ASSOCIATION.

IN the department of Economic Science and Statistics, Mr. W. Morris (Halifax) read a paper on capital and labour. He condemned the aggressiveness of trade-unions, and said that the reduction of the hours of labour had been carried too far. Wages had been advanced to a point which must be attended with national loss, and would react upon each member of the community. If it went on much further, we should gradually but surely be beaten out of the foreign markets, and our export trade would be gradually destroyed The interference with piecework by trade-union combination was inflicting an injustice upon the skilled workmen, whilst the unskilled obtained an advantage. Wages would no doubt fall to their natural level, but they might not do so until we had lost our foreign trade. The only remedy to arrest the existing evils brought about by the combination of workmen under the guidance of clever but ambitious and short-sighted men, was a counter organisation of capital, elaborately organised, and so extensive as to completely overlap trade-union combination.

Mr. Leone Levi next read a paper on the effect of the increase of prices in certain necessaries of life on the cost of living, and its relation to the rates of wages and salaries. He remarked that from whatever cause it might have arisen,—whether from the large addition to the stock of gold during the last twenty years, or from the excess of demand over supply of the principal articles of food and other necessaries,—it was a fact beyond question that the cost of living in the United Kingdom had become greater than it used to be, though the extent of the increase was by no means so great as many were disposed to imagine. On the economic importance of this fact it was almost needless to dwell. An increased cost of living of necessity demanded increasing wages. Increasing wages meant an increasing cost of production, and the latter meant a corresponding disadvantage in international competition. To arrive at the absolute increase in the cost of living of a town artizan or an agricultural labourer, of a middle-class or a nobleman's family, in consequence of the rise in prices of certain commodities, they must regard the relative position of such commodities in the ordinary budgets of the respective parties. It was important, however, to guard against exaggerations respecting the increase in the cost of living. The Professor, after speaking of the increased price of provisions during the last ten years, proceeded to review them in relation to the effect on the cost of living. He said that, having regard to the fact that the agricultural classes constitute almost one-fourth of the entire number of the labouring class, the actual increase of prices, and nothing else, was almost 15 per cent. The increased cost of living arose to a large extent from the demand for more expensive articles of clothing. The cost of luxury had no bounds, and it was not so easy to get out of this extravagant mode of living. When once a permanent scale of expenditure had been established, that article which had been formerly regarded as a luxury became a sheer necessity on all sides, though it was found that if the cost of living had increased, so had the rate of incomes, the general result being a decrease of pauperism and an increasing amount in the deposits of the savings-banks.

In the course of the discussion which ensued, Lord Houghton expressed the opinion that perhaps the question belonged rather to the sister association, the Social Science Congress, than to this Association. He would say it had already struck him that they talked a deal too much about the contest of capital and labour. He could not help thinking that when the question did come to be finally resolved and understood, it would be discovered there was no contest at all. The essential difference between employer and employed regarding accumulation of wealth was, that the capitalist, having saved money, was enabled to distribute it to the working class. The question was altogether one of distribution, and a man could not spend a great deal of money for his own personal real gratification without distributing it to others. If they could only make the working class clearly understand that there was no difference worth considering between the condition of the capitalist and their own, they would, he thought, be brought to a very different construction of the question. Mr. Powell, M.P., referred to the increased prosperity of the country, and observed that in a commodity which was brought from the ends of the earth there was not a corresponding increase in the price, but where they had a commodity produced in this country they had a sensible increase. Professor Levi said the expenditure in actual relief of the poor had increased from 6,077,000*l.* in 1862 to 8,070,000*l.* in 1872. That had arisen from the increase in the price of food. The President, referring to the remarks of Lord Houghton, said that one of the great causes of evil on both sides of the question was that the scientific laws which governed the relations of capital and labour were forgotten.

In the Mechanical Science Section, the opening address was delivered by Mr. W. H. Barlow, F.R.S. It was occupied with the nature, properties, and application of modern steel, and embraced the details of the committee appointed some years ago by the Institution of Civil Engineers, of which Mr. Barlow was a member. The president referred to the utility of steel for shipbuilding, boiler-making, guns, crank axles, and bridges, in replacing cast and wrought iron. There was a good attendance of engineers, many of whom were distinguished men, and some of whom spoke on the restrictions placed on the use of steel by the Board of Trade, which it was hoped would soon be relaxed. A hope was also expressed that the British Association would use its influence in calling attention to the subject.

The papers on the "Sand Blast Process" for cutting hard substances excited considerable interest. Specimens were handed round for distribution, and a discussion ensued on the extent to which the blast could be used for mining and other purposes.

Professor H. Smith, in the course of his opening address to the Mathematical and Physical Sections, spoke of the value of "original research," that is to say, search after new truths for their own sake, without any reference to their commercial value or immediate usefulness. Euclid and Apollonius, he said, studied the nature of the curves formed when a cone was cut in various directions by a plain surface; the said curves being known as "conic sections." Had they been asked,—"What was the use of these curves?" they could scarcely have given an answer, as conic sections had then no tendency to solve any scientific problem, and for 2,000 years were of little value; yet they afterwards gave splendid results in solving scientific problems which beset Kepler. Without conic sections there would have been no Kepler, without Kepler no Newton, and without Newton no modern science as it is at present. He spoke in favour of State aid to scientific education, and of better methods of teaching physical science in schools.

In Section D, Anthropology, a paper "On an Age of Colossi," was read by Mr. John S. Phenè, F.S.A. The paper commenced with a slight sketch of the theory of the ages of stone, bronze, and iron, as generally recognised by anthropologists, for the purpose of bringing forward a feature which, in the author's opinion, would at a future period considerably modify present ideas on this subject,—the geographical feature, the effect of which, he thought, could be hardly understood till we were able to correlate more perfectly the antiquities of distant countries. He argued that, assuming a wave of emigration from a common centre to bear forward any distinct characteristic, whether of these recognised features, or of colossi, or otherwise, such wave might, in pre-historic times, while portions of it terminated abruptly near its source upon desirable spots being attained, travel indefinitely by other sections over an enormous area, even giving rise to the secondary or sub-waves of exodus; the results of which might produce the strange features discovered by subsequent travellers of a civilised or historic age setting in, either from a succeeding wave or some other cause, which would reach to the settlements from which the sub-exodus proceeded, but not follow the offshoots; hence that in an age highly historic and civilised in a given geographical area, there might be found people with the same features, traditions, myths, and roots of language in a barbarous or pre-historic age or condition outside that geographical area; and that, in consequence, any particular age so identified might be, or seem to be, indefinitely long from the retainers of its characteristic wandering beyond the reach of communication. After drawing attention to the inhabitants of what he termed the three great centres of colossi, and which he designated as Egyptian, Malayan, and pre-Mayan or Mexican, he illustrated by diagrams and drawings the favourite emblems of these creators of colossi, from which it appeared that on a broad basis there were both an architectural and emblematic similarity in their works, the pyramid, the obelisk, the monolith, and the elevated platforms being prominent features in each, the worship of the sun apparently common, and colossal emblems of the human figure, reptilia, and birds abounding. Easter Island, as representing Polynesia, was included, and the same physical features and climatic conditions were found approximating in these different centres. He expressed a belief that a careful study of the poetic language of the Singhalese would aid and stimulate researches in the forest-covered cities of Ceylon; and those of the ancient Maya (if possible), and the Quiché peoples unravel the mystery of the now impenetrable cities of Mexico and Central America. While these

cities, with their colossi, were so buried, we had much to learn of the history of the human family, and the age in which their colossi were executed. This part of the question was too extensive for a single paper, and he would confine himself, by way of illustrating his argument, to what seemed to him the result of an offshoot from such a preceding wave as he had supposed, which he considered had laved its final billow on the shores of Britain. He first pointed out that the highly civilised nations of Greece and Rome were not originators of colossi, but elaborators of the raw-material ideas of the Egyptians, as shown by their exquisite symmetry, and the costliness of the materials of their gold and ivory colossi. He then gave a number of examples of similar accompanying features in Britain, Egypt, Mexico, and Malaya. He found parallels of design in the plans of some Oriental cities and the horse-shoe of Stonehenge, in the circle of Copan and those of Avebury, the Giant's Ring, and others; and finally argued that we had not only these collateral evidences, but actual colossi of the ancients in these lands, in enormous monoliths, in venerated idols, as, amongst others, the celebrated rock, the traditional goddess Andras, and the enormous Wilmington Giant, both in Sussex, and the latter of which is now being restored, with the consent of the Duke of Devonshire, and which, he quoted Cæsar and Strabo to show, agreed identically with the description given by those writers of the vast Celtic deity to which were sacrificed human victims, wild beasts, and cattle, and of which Cæsar says they had many images.

A lecture to working men, delivered by Professor Siemens, on the subject of "Fuel," attracted a crowded audience at St. George's Hall. The subject was dealt with under the following heads: — First, "What is Fuel?" second, "Whence is Fuel derived?" third, "How should Fuel be used?" fourth, "The Coal Question of To-day;" fifth, "Wherein consists the Fuel of the Sun?" Each of these points was elaborated in a popular manner, the one dealing with the use of coal being of necessity the most interesting. It was estimated by the lecturer that if coal were consumed in a careful and judicious manner the consumption might be reduced 50 million tons a year, though, of course, such an economy would involve a very considerable expenditure of capital. In 1872 no less than 123,000,000 tons of coal were got up from the mines of England and Wales as against 83,500,000 in 1862, a fact which led to the conclusion that unless economy were practised the consumption thirty years hence would be 250,000,000 tons per annum, and that therefore progress in effecting economy ought to be accelerated as much as possible.

A paper on the question of Railway Amalgamation was read at one of the meetings by Mr. B. Haughton, C.E., of London. He pointed out that objections were entertained both to the working of the railways by the State and to the present system of management. The first reason was, because the work would be too great for any Government department, and would be unremunerative; and the second, because it was regarded as unequal to the necessities of the age and the wants and demands of the public. As a compromise between both, he recommended an amalgamation of the existing railway systems into four groups, of which three would run north and south, from Inverness to Dover by way of London; and the fourth, from Land's End to Liverpool, Manchester, and London. He contended that this would produce a smoothness of action upon the railways, and would meet the ordinary wants of the travelling community.

A discussion followed, in which Mr. Botley, Major-General Syngo, Mr. F. P. Fellows, Mr. F. Wilson, Mr. Chadwick, Professor Leone Levi and others having addressed the section, the president, in bringing the discussion to a conclusion, pointed out that railways were not entirely the result of unassisted private enterprise, but that they never would have come into existence at all but for the Government which helped them by giving them great power in forcing people to sell property, and in conferring upon them also a right of way all over the country, which they could not have obtained otherwise. As to the purchase of railways by the State, his own opinion was that the Government had quite sufficient work on their hands at present, and that such a scheme would place at their disposal patronage which would excite considerable jealousy throughout the country.

NEW ROLLING STOCK FOR THE SOUTH-EASTERN RAILWAY.

A SUGGESTION.

THE South-Eastern Railway Company are now engaged in the construction of a large and valuable addition to their rolling stock, at their extensive carriage and engine works at Ashford, which occupies an area of upwards of 12 acres. The new stock now building, consists of upwards of 130 first, second, and third class carriages, all of them on a novel and much improved principle; and in addition to these there are also in course of construction several large family saloon carriages, which are to be furnished with lavatories and closets, and fitted with water-tanks, and all necessary appliances, for the comfort of travellers. The new stock also includes several luggage and break vans.

The new first-class carriages are forty-four in number. These carriages, which are very roomy and handsome, are 27 ft. long, and 8 ft. 4 in. wide, 7 ft. high in the centre, and 6 ft. in the doorway, and each passenger has 21 in. lineal of seat-room. The seats have one elbow rest in the centre. There are four compartments in each carriage, and each compartment is seated for eight passengers. They are lined with fine blue cloth, and trimmed with blue and white cord and lace, into which the company's monogram is worked in reversed couples. In the construction of the new smoking-carriages in this class, Mr. Mansell's improvements have been adopted. In order to obviate the offensive odour with which the cloth linings of a first-class smoking compartment becomes saturated, the compartments of the new carriages set apart for this purpose, are lined with dark blue morocco leather, and the compartments are also fitted with brass spittoons, which have a slope towards the centre, and the contents are discharged through a tube at the bottom. The floors are covered with oil-cloth. Brass plates, with chequered surfaces, are also fixed in the smoking compartments for striking "vesuvians," and the side lights have the legend in frost work, indicating that they are for smoking. The whole of the carriages are fitted for the electrical communication between passengers and guard, as patented by Mr. Walker, the electrical engineer to the company. Over the seats of passengers in the ordinary first-class compartments, there is a series of three printed notices, surrounded by an ornamental gold border. The central notice, illustrated, explains the action of the communication with guards, and the consequences of tampering with it. This is printed in English, French, and German. The notice on the left announces the prohibition of smoking in the compartment, and the penalty. The notice on the right contains a caution against opening the doors, or attempting to alight before the train is at rest. On each side of these printed notices there are framed glass mirrors, 2 ft. long by 5 in. wide, very decorative, but undesirable in the event of a collision. In appearance the three classes of carriages are all very much alike, as to height, colour, and other features. They are painted crimson lake in the lower quarters, and picked out with deep gold, and fine lined with vermilion.

It would be a great advantage if, on all lines, the first, second, and third class carriages were painted different colours; and greater still if the same three colours were adopted on all lines, so that passengers would everywhere at once know into which carriages to enter. The new brake and luggage vans are large, strong carriages, and well adapted for the traffic for which they are designed. The guard's compartment is in the centre, which rises above the other carriages in the train, and is glazed at the top to the front and back. The compartment also projects at the sides, about 10 in., and is glazed, so that the guard can command a complete view of the line to front and rear while in the open, and in daylight, and the head and tail lights and signals after dark. The whole of the carriages and stock have been designed by, and built under the superintendence of, Mr. Cudworth, the company's locomotive engineer and superintendent, and Mr. Mansell. It may here be stated that the whole of the company's rolling stock, including locomotive engines, carriages, and wagons, are now manufactured at the works at Ashford, which may be regarded as the Crewe of the London and North-Western Company. Upwards of 1,000 artizans are permanently employed at the works, which has given a considerable impetus to the trade of Ashford.

BASSENTHWAITE CHURCH, CUMBERLAND; COMPETITION.

THE design selected to be carried out is by Mr. D. Brade, of Kendal,—motto, "Skiddaw." The second premium, 25*l.*, has been awarded to design under motto "Barf," by Mr. J. S. Seymour, of Carlisle. Mr. Jas. Fergusson, F.R.S., was the referee consulted by the committee.

HEALTH IN BIRMINGHAM.

WE understand that in one of the districts of Birmingham, where an epidemic of typhoid fever prevailed last summer, the disease has again broken out. The previous outbreak was investigated by Dr. Ballard, who censured the local authorities for inattention to drainage. Again typhoid fever has appeared, and, according to statements made in a memorial signed by the residents, the local authorities have been guilty of neglect of sanitary precautions. A piece of vacant ground in the midst of a large population has been selected as a depôt for the deposit of night-soil, which is carted thither by the servants of the Board. Two cases of fever exist in the street where this has been going on for some weeks.

We remember that when three or four years ago (during the meeting of the Social Science Association) the conductor of this journal ventured to point out the dangerous conditions existing in parts of the town, his statements were met with shouts of derision, and, in some quarters, of abuse, and the town was pronounced to be the healthiest in England. The authorities have had several practical warnings since then. Let them take heed.

THE SLEEPING SALOON ON THE LONDON AND NORTH-WESTERN RAILWAY.

A SLEEPING-SALOON has been built by the London and North-Western Railway Company, at their Wolverton Works, and will be run for the first time between Euston and Perth, on the 1st of October. Some account of it will probably interest our readers.

The saloon is 30 ft. 6 in. long, 8 ft. wide, and 7 ft. 9 in. high at the centre of the roof (all outside dimensions). The entrance is by means of a lobby from side to side; the framing of the body is of English oak and mahogany panels, and the under-frame is also of English oak, the sides of which are plated with ¼-in. angle iron, 8 in. by 4½ in., and fitted with three pairs of Mansell's patent wheels and tyre-fastenings. The lower part of the body outside is painted a purple lake, and the upper part with pure white, the whole being picked out, lined, and decorated with gold-leaf. The interior of the saloon, which consists of three passenger compartments and two lavatories, one at each end (which include water-closets), and having a corridor through the centre, will seat four persons in each compartment by day, and sleep the same number at night. The arrangements for the latter are as follows:—The four seats, which are made in the frames, in each of the three compartments, and can easily be drawn forward so as to meet in the centre, will accommodate two persons at night, and there are upper berths, covered with a figured *crétonne*, for other two persons: these during the day are suspended against the roof, and being carried by quadrants or lazy-tops, and balance-weights (unseen), are easily drawn down to a height of about 4 ft. from the floor at night. To enable the passengers to reach these berths with ease, a pair of movable folding-steps is carried in each of the compartments, so constructed, by means of a movable top, as to form a reading or other table during the day. The interior of the saloon is handsomely fitted up. The roof is lined with sycamore panels, and Hungarian ash mouldings. The sides, ends, and lavatories are of walnut, with Hungarian ash mouldings, and surmounted with gold mouldings throughout. The trimmings are of a dark blue silk tabaret, and the carpets are of crimson pile. The compartments throughout, and the lavatories, are fitted with mirrors. Sabberton's patent ventilator, round the roof lamp in each of the compartments, is used as part of the ventilating arrangement.

The saloon will be run three times a week, namely, Monday, Wednesday, and Friday, from London to Scotland, and from Scotland to London on Tuesday, Thursday, and Saturday.

Ten shillings in addition to the first class fare will be the charge made to each passenger for the accommodation.

ROYAL HORTICULTURAL SOCIETY.

SOME of the fellows of the Horticultural Society, especially debenture-holders and compounders, feel a little disquiet in respect of the present position of affairs, and want to know what is doing at South Kensington and who is doing it. Since the old council went out, making a very poor fight, by the way, and the new council or *quasi* council went in, there has been a dead silence beyond the doors of their meeting-room. Whispers, or rather echoes of whispers, have, however, reached the outer body to the effect that the new council is no council at all, not having been properly appointed, and that any acts of theirs would be illegal, so that the old council could not even negotiate with them if it were desired. If this be true, we are not able ourselves to assert it, and that a lawsuit to settle the legality of the governing body looms in the distance, coupled with the assertion that the lease is actually forfeited to the Commissioners of 1851, to whom the Society owes some 30,000*l.*, it is surely time for the Fellows to look into the matter for themselves, and take such steps as may seem necessary. We have heard it said that the Commissioners would probably not object to release the Society from all their obligations, pay the debentures (49,000*l.*), and take to the gardens for the use of the public. But, of course, there would be two words as to that. Anyhow, *something* must be done.

A PLAN OF PARIS IN RELIEF.

THE central transept of the Palais de l'Industrie, Paris, is at present occupied by a novel exhibition. It is a vast raised plan of "Paris Besieged," minutely mathematically executed by the well-known engineer officer, Colonel Liénard. It is imbedded in the ground-floor of the Palais, and exactly situated with respect to the current of the Seine. The scale adopted is of one millimètre per mètre. This proportion, which is sufficiently large to give an accurate idea of the plane dimensions of the territory, would not be so with regard to the heights indicated. The visitor's point of sight is inverted: he sees as though from a balloon. The scale has therefore been doubled for the city monuments and the natural elevations of the ground. This fiction admitted, it is found that the position of the forts and batteries of the first and second zone, that of the villages, battlefields, and forests, is very accurately described. The plan has been constructed for a strategical purpose, for the instruction of military students and officers. It is easy to judge from this reproduction that the "circle of iron" was no vain picturesque phrase. Every Prussian gun is modelled and mounted. The fatal hills of Chatillon, Lhay, and Fontenay-aux-Roses are marked with the number of men who fell there; as are the plains of Bourget, Champigny, and Buzenval, where the forlorn hope of the besieged was finally wrecked. The general aspect of the plan is marvellously picturesque. The green powder representing plains and lawns; the dried moss which forms the forests; the glass river, and plaster of Paris houses and monuments, are all executed with much artistic taste, and not a little precision. In a few points Col. Liénard has been led into errors by following too literally the imperfect ordnance maps distributed by the Ministry of War. The entire mass of Paris buildings is unduly diminished in area. Several small villages are not indicated, and one hamlet appears on the plan which has no existence whatever in reality! But with the imperfect materials at his command Colonel Liénard has done all that could be expected.

The plan, completed and corrected, will be permanently established in a week or two in the ground of the old Ministry of Finance, in the Rue de Rivoli. It will then be surrounded by a panorama extending the plan to St. Germain, Versailles,—in a circuit of about thirty miles round Paris. The whole will be eventually transported to the Invalides, where a fine collection of raised plans already exists.

New Docks at Wemyss.—A spacious new dock, built by Mr. Wemyss, of Wemyss Castle, at a cost of about 10,000*l.*, has been opened at West Wemyss, a port in Fifeshire.

THE CASTLE OF EWIAS HAROLD.

THE "Castellaria Aluredi Ewias," of Domesday, was a tract, the particulars of which are not known, but which no doubt lay among those lines of hill and valley which converge like the fingers of a hand upon the Worm and the Monnow, between the Golden Valley and the Black Mountain, and form the south-western portion of the county of Hereford. The actual castle, "Castellum Ewias," stands about six miles within the border, and about three miles outside or west of the presumed line of Offas Dyke at this point. The country is hilly, but fertile, well worth the defence, for which it affords many natural advantages. The immediate position is chosen with great skill, though it required an immense application of human labour to make it an almost impregnable fortress against the fierce and active hordes of Welshmen whose alienated patrimony it was intended to grasp. While the Mound of Builth remains an evidence of English rule, that of Ewias can scarcely be regarded as the advanced post, the "Castle Dangerous," upon the British territory; but it must nevertheless at all times have been a post of very great danger, and have borne, with Kilpeck, the brunt of the ordinary and frequent attacks of the men of South and West Wales upon Hereford.

In selecting the position advantage was taken of a tongue of high land, broad towards the west and north, but which came rapidly to a narrow and almost abrupt termination in a point about 300 ft. above and within the junction of the two adjacent streams. Of these the larger flows along the northern front of the position, and the smaller down a deep valley along its southern front. The two meet a few score yards below the high ground; and upon the left or further bank of the larger stream, and a short distance above the junction, is the church, and attached to it the village, to which the castle and its English lord have given the distinguishing name.

It was decided to convert the point or eastern end of the high ground into the proposed strong place, and to form thus, in the northern fashion, an isolated mound. With this intent a broad and deep ditch was cut across the ridge, curved so as to embrace about one-half of the future elevation. At its north end the ditch was carried straight down the hill-side towards the brook. At its south end it came to rather a sharp conclusion, running out upon a natural bank and slope. Here, however, it was in some sort resumed at a lower level, and ended in a shallow ditch at the southern or principal entrance to the castle. The part thus isolated by the ditch formed the circular base of a mound of about 120 yards diameter and about 30 ft. high. This the addition of the soil from the ditch raised to about 70 ft., and thus gave it, in the military sense, a command over the adjacent part of the original ridge. On its opposite, or eastern side, the mound does not descend at once towards the junction of the waters, but at its foot is a broad semicircular platform, which covers its east, north-east, and south-east fronts, and from the outer or convex edge of which descends a steep slope towards the water, which is again succeeded by slopes of a far more gentle character, and which are not included in the military works.

A fair general idea of this stronghold may be given by supposing a circular platform of 200 yards diameter to be bordered on the east and adjacent sides by a steep natural slope falling from its edge, and on the west and adjacent sides by a steep artificial slope falling to its edge. Then on the western margin is placed a conical table mound, 60 ft. or 70 ft. high, and about 120 yards diameter at the base, which necessarily converts the western slope into the further side or counterscarp of a ditch, and reduces the eastern side to an open crescent-shaped platform. Such is the original plan of the Castle of Ewias, and such its present appearance after the complete removal of the masonry which for about 600 years adorned or encumbered its earthworks.

The top of the mound is oval, about 34 yards north and south by 40 yards east and west. Upon it has stood a shell keep, either circular or many-sided, about 30 yards diameter. Although no masonry remains, the outline of the keep is plainly indicated by the trench which has been dug while the foundations were being grubbed up. The keep seems from this to have stood, not in the centre, but nearer the eastern margin of the mound, probably to allow room for a couple of exterior towers, or perhaps a gate-house, which seems to have stood where now are some circular pits. Towers would be well placed on this the weakest side, so as to give a still greater command over the approach along the high ground. There is no trace of any regular ascent to the keep,—no mark of an original winding path up the mound, that now in use being evidently very modern. The side is so steep that no wheeled carriage could ascend it, and scarcely any heavily-laden horse. Probably the way up lay by a direct flight of steps, as at Hawarden and Carisbrook.

There is no trace of a well. The material of the keep was evidently a hard schistone bed of the old red sandstone, fragments of which are seen in the excavations.

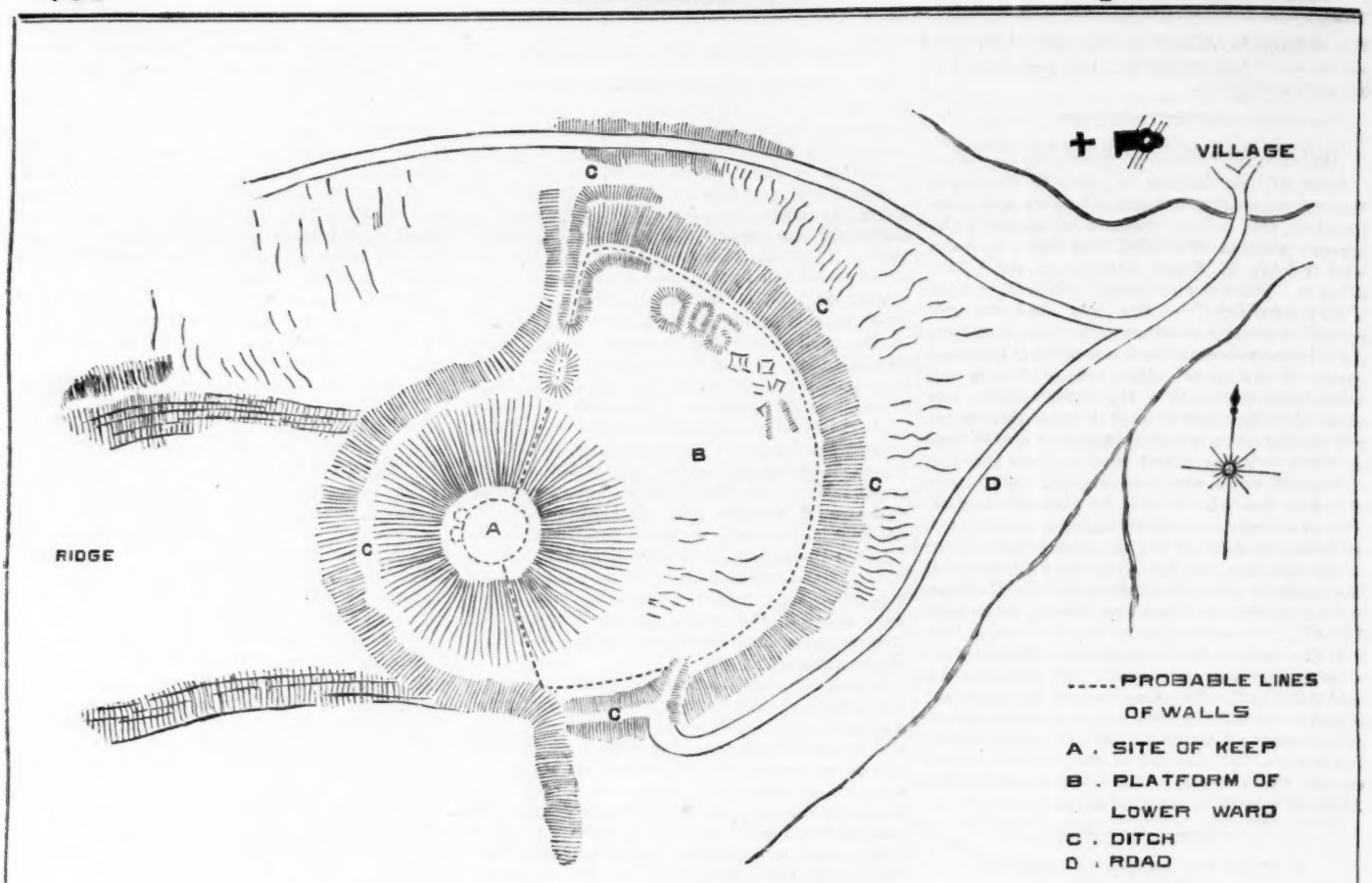
The outer ward or crescent-shaped platform, below and west of the keep, runs out to a point towards the southern end, but to the north or north-west it is stopped at a breadth of about 42 yards by the prolongation of the keep ditch. The breadth of the ward at its greatest is about 60 yards. Along the north-west front it is strengthened by large earth-banks thrown up from the contiguous ditch, but elsewhere the natural slope of from 30 ft. to 40 ft., steeply scarped, needed neither ditch nor bank. This ward had a curtain wall along its outer edge, of which the foundation diggings remain open. The north-west end was continued up the mound, and probably the circuit on the opposite side was completed in a similar way, so as to make the mound and keep, as at Tamworth and Durham, a part of the general *enceinte*. A group of excavations shows that this ward contained a considerable number of domestic buildings placed in its north-eastern and eastern part, near to the curtain wall. At the foot of the mound to the north is a sort of notch in the line of bank, possibly indicating a postern. The main approach evidently rose gradually from the village bridge, and skirted the foot of the eastern slope of the outer ward nearly to its south end, where it turned inwards and entered that ward by a roadway or slight cutting.

There is no trace of masonry to be seen within or about the castle *enceinte*; the material seems to have been in request as building stone, and to have been everywhere collected and even grubbed up with most covetous care. There is a limekiln on the south side, near the line of the entrance, no doubt built of the materials of the castle, and a sort of house, now a shed, between it and the brook, but the material shows no mark of the tool and no old mortar.

There are some mounds between the castle and the brooks, possibly thrown up on the occasion of some attack by the enemy. On the other or high side there are no outworks nor any indications either of attack or defence.

There are no remains of the priory, which was evidently attached to the parish church? This is a good-sized building, recently repaired or restored, and in excellent order. It is composed of a tower, nave, south porch, and chancel. The nave has been so completely restored that little of old work is to be seen in its walls or roof. It is probably in substance of Decorated date, judging from the buttresses on the south side. The porch is new. The chancel has in the north wall a sepulchral recess, of Decorated pattern, covering the original recumbent figure of a female with her hands in prayer, holding what looks like a covered cup. In the south wall are two lancet windows of one light, under Pointed recesses, and between them a late Decorated window of two lights, trefoiled, with a plain four-sided opening in the head. The whole is in a round-headed recess. The arch into the nave is new.

The tower is the best part of the church. It is of large size, square, and short for its size, probably having had another story. It rests upon a bold plinth, about 5 ft. 6 in. high, at the top of which is a bold half-round cordon, with a band. The south-west angle is covered by the pilaster buttresses, of 8 ft. 6 in. breadth, and a foot projection, which die into the tower, near the present summit. In this angle is a well-stair. In the south side is an unusually large door, of 8 ft. opening, with high lancet arch. In the centre of the flat jamb on each side is a half column, 2 ft. diameter, with a water-bearing moulding, and a sort of bell-cap, with several bands of moulding above it. The arch is plainly chamfered, and the cordon of the tower is carried round it as a hood. Above this is a clumsy window of two lancet lights under a pointed head, very plain. Above this again is a small broad window, with a trefoiled head, and above all an Early English window of three lights,



The Ancient Castle of Ewias Harold.—Ground Plan.

with three-quarter shafts before each mullion, with bell-caps. In the nooks of each jamb are two similar shafts, seven in all. The head is a drop pointed arch, plainly chamfered. There is a window similar to this in the north wall. The church contains nothing earlier than this mixture of the Early English with the Decorated style. The masonry of the castle was, probably from its plan, of a late Norman, or transitional date. The earthworks are of the regular Herefordshire type; such are attributable to the English of the early part of the tenth century. They resemble generally, in the possession of a mound, those of Kilpeck and Builth, Caerleon and Cardiff, of Brecon, Abergavenny, and many places in this county or district. No doubt this and the similar works were thrown up when the early Saxon inroads were made into Wales, and were the strongholds of the invading chiefs.

Ewias Harold certainly does not bear the name of its founder, and that founder was probably as completely forgotten in the eleventh century as now.

There are two places called Ewias in Herefordshire, distinguished by the names of their eleventh-century owners, as Ewias Lacy and Ewias Harold. Both are mentioned in Domesday, and both as the seats of a castelry, a sort of honour or superior lordship attached to the castle. Under the lands of the church of Hereford, we are told that "in the manors of Dodelegie and Stane are ten hydes, all waste save one in Dodelegie. Of the nine, one part is 'in castellaria Aluredi Ewias,' and the other in the King's enclosed land."

Another entry explains that Alured was Alured de Merleberge or of Marleborough, a great tenant in chief, especially in Wiltshire. We read, "Alured de M. holds the Castle of Ewias of William the King. For that king conceded to him the lands which William the Earl [Fitzosbern of Hereford] had given to him. Who refortified [*refirmaverit*] this castle." Of it held seven knights, whose Christian names are given, besides other persons. The castle was then valued at 10*l*. Agnes, the daughter of Alured, married Turstan of Wigmore.

How or when Alured gave up the castle does not appear; but in 1100 it was held by a certain Harold, also a large tenant in Domesday, though not in Herefordshire. He is called "Heraldus filius comitis Radulphi," and as such held Sudeley, in Gloucestershire. Earl Ralph, called the Timid, was the Earl of Hereford who was beaten by the Welsh and English forces in 1055, when his son was a mere child. Ralph was a considerable man by descent, being great grandson of Æthelred and great nephew to the Confessor. Harold probably obtained some of his father's possessions when he came of age, and Ewias may have been part of them. He and his descendants were liberal donors to St. Peter's, Gloucester, in its behalf founding the Priory near the Castle of Ewias.

The names and order of Harold's sons are preserved in the Gloucester Cartulary, and they correct Dugdale and all other authorities. They were Robert, Roger, John (to whom his father gave Sudeley, and whose issue were barons), Alexander, and William. Robert de Ewias, the eldest, is described in the Gesta Stephani as "vir stemmatis ingenuissimi." According to the Liber Niger, he held *in capite* upwards of forty-seven fees, the mesne tenants of which were twenty knights. Dugdale mentions only twenty-two fees, and confounds him with a second Robert, his son, also Lord of Ewias. The elder Robert had by his wife Sybilla, Robert, and Richard de Ewias, who left a daughter and heiress, Sybilla, who married Philip Spenser, and left issue.

Robert de Ewias, the third owner of the castle, and the second baron, married Petronilla. He was living 1194–6. He also left a Sybilla, daughter and heiress of Ewias. She married, first, Robert de Tregoz; second, William de Newmarch, whom she married during her father's lifetime, in the reign of Richard I. He was living 11 John. Third, Roger de Clifford, probably the second brother of William de C. From this match spring the Earls of Cumberland. Newmarch had no children. Sybilla was dead 20 Hen. III., and was followed by her son, Robert de Tregoz, slain at Evesham 1265. He was father of John and Henry, father of a line of barons who ended about 1405.

John de Tregoz died 1300, leaving two coheirs, Clarice and Sybil. Clarice, who died 29 Ed. I., married Roger la Warre, and had John, aged 23, in 1300; and Sybil married Sir William de Grandison, ancestor in the female line of the St. John's, Viscounts Grandison. In the partition, John la Warre had the "body of the castle," of which, 4 Ed. III., he enfeoffed John de Cleydon. He died 21 Ed. III. John, his eldest son, died before him, and as early as 12 Ed. III. he had enfeoffed his grandson, Roger la Warre, and Elizabeth his wife, with Ewias Castle and Manor.

Roger la Warre died 44 Ed. III., seized of Ewias Harold, and was succeeded by John, his son. 13 Rich. II., Sir John de Montacute, sen., is seized of Ewias Harold, and three Wiltshire fees in the Honour of Ewias, and Teffont-Ewias, in Wilts, besides other Ewias lands in Herefordshire. 18 Rich. II. these same lands were held by Margaret, wife of Sir John Montacute, bart.; and 10 Hen. IV., by Thomas de Montacute, Earl of Salisbury.

The nature of this alienation is obscure; for, in the midst of it, 22 Rich. II., Sir John de la Warre and Elizabeth his wife are seized of the Castle of Ewias Harold. However, there seems to have been an actual and permanent alienation to the Montacutes; for, 7 Hen. VI., Thomas, Earl of Salisbury, has Ewias Harold. Thence it passed to the Beauchamps, of whom Joan, widow of Sir William Beauchamp, of Bergavenny, had the castle, vill, and lordship in 14 Hen. VI.; and finally the Beauchamp heir, Edward Nevile, Lord Abergavenny, died seized of the castle, &c., in Herefordshire, and of Teffont-Ewias, in Wiltshire.

G. T. C.

NEW BOSTON, UNITED STATES.

THE great fire at Chicago two years ago so astonished the world with the vastness of the destruction occasioned by it that the catastrophe at Boston which followed shortly afterwards, although in itself almost as disastrous, seemed to be comparatively unnoticed, and to excite but little comment. The rebuilding of Chicago, to which we have drawn attention, has been carried on with such vigour and energy as to astonish the Americans themselves, so rapid has been the restoration of the city; and amid the wonder which the energy of the inhabitants of the "capital of the West" has drawn forth, the restoration of its Eastern rival has been carried on quietly but surely, almost unheeded, and without exciting even that curiosity which its destruction caused.

Less than twelve months ago a large portion of the city of Boston was reduced to ashes; at the present moment hardly a trace of the fire remains; the burnt district has been almost entirely restored. Help in money and materials poured in from all sides; Chicago herself, which but a short time previously had been the object of Boston's charity, returned her gift with interest; but the people of the stricken city did not sit down to count their losses and ask for help,—they at once set about repairing the damage their homes had suffered, and as soon as the flames were extinguished braced themselves to the task of restoring the ruins. Following the example of her younger sister, Boston was not long in removing the traces of the sudden catastrophe that had overtaken her; and next to the rapidity with which the flames wrought their work of destruction, nothing could exceed the vigour with which the new buildings were erected. Taking those that are already finished as a criterion of the whole, the new structures will be much handsomer, and of a better class than those that they replace. The walls are heavy and firm, the material is of good quality, and the architecture is, in American eyes, as nearly perfect as the wants of the business men who are to locate there will allow. As a rule, the buildings are not more than four or five stories high, and every possible protection that can be practically applied has been adopted against the recurrence of another conflagration. "In a very short time," says the *Boston Post*, "it will again be a matter of history that a person could stand at the head of Bromfield-street and look out upon the harbour, with its islands and its commerce, for the view is already nigh shut out. The whole area of the acres that were so terribly swept over by the fire now bristles with stagings, derricks, and hoisting gear, and with the network of guys and tackle the tangled state of affairs is almost bewildering, even to those who once thought they could successfully shape their course across this quarter of the city.

The scene is one of the busiest activity. Almost every lot in the district is in a state of improvement, and large piles of the worthless-looking material have disappeared. What remains is being rapidly sorted and saved for new structures, or carted away to fill the neighbouring flats. There are, indeed, large quantities of brick and stone that look formidable enough at first sight, but in many cases the trenches for the walls have been opened around them, and the basement full of bricks is looked upon as so much stock already paid for and ready on the spot.

Owing to the time when the street commissioners were able to give builders their lines upon other streets, the greatest progress has naturally been made upon the old portion of Pearl-street, High-street, and the southerly side of Summer, the greater part of which localities are now covered with buildings finished or well advanced. But the question of boundaries is now settled, and everything moves simultaneously from Washington-street down to Broad, and from Summer to Kilby. The army of workmen that throngs the streets leading out of the district at noon and in the evening is large enough to remind one of the crowds of labourers that fill the streets of our large manufacturing cities, and the result of their daily labour it is hard to approximate. The progress that is made is most encouraging, the changes being noticeable even to the daily passer-by."

The greater number of the burnt buildings have already been re-erected, most of them in a more solid and imposing manner than before, and building operations are being carried on so quickly that where a few months ago the ground was covered with blackened ashes to the extent of hundreds of acres, new and more commodious houses have sprung up.

As in Chicago, so in Boston, many of the larger edifices are faced with stone; this material is however used to a very limited extent, enough only being employed to give an appearance of richness to the front of the building, and there is a sameness of design about the buildings which gives a certain amount of monotony to the long avenues of houses with which Boston abounds. The fire, however, cannot be said to have been an unmixed evil; for, though the city was not the mixture of huts and palaces which could have been seen at Chicago before the fire at the latter place, yet it possessed many blocks of poor houses which will hardly be rebuilt now, and the work that is going on will certainly improve its appearance to a wonderful extent. The "new" part, indeed, already surpasses the other portions of the city.

FRANCIS PRICE, HIS PATRONS AND HIS BOOK.

THERE is a work well known to old building workmen and writers on constructive carpentry and joinery, called "The British Carpenter." The first edition of the book dates back to the year 1733, but the success that attended its first publication led to repeated editions up to 1759, when the fourth edition, considerably enlarged, was published, illustrated with sixty-two copperplates. Connected with this book there are one or two matters which are worth notice. As it was customary in the eighteenth century to cast about for noble patrons when an author was about printing his book, Francis Price did not form an exception. "The British Carpenter" is dedicated to the "Right Honourable Algernon, Earl of Hertford, Baron Percy," &c. As the dedication is short, and characteristic of the period, we quote it here:—"My lord, your natural inclination to encourage arts makes me presume to lay this treatise of carpentering at your lordship's feet, hoping it not unworthy your patronage, since it is part belonging to architecture. As this branch of building has never been usefully treated of, I have endeavoured to explain it so as to render it useful; therefore, nothing more is wanting to recommend it to the world, and secure it from malice and envy, but the protection of so noble a patron. I am, my lord, your lordship's most obedient and dutiful servant, Francis Price." The above patron was the Algernon who was created Earl of Northumberland in 1749. This Algernon was the son of Lady Elizabeth Percy, the daughter of the eleventh earl, who died at Turin in 1670, and in whom the chief male line became extinct. Before this Algernon succeeded to the title through his mother's blood, his father being Charles Seymour, Duke of Somerset, there was legal warfare carried on for a long time, several persons claiming to be of the blood of the Percies; among the rest, a Dublin trunk-maker. So much *en passant* about the patron of Price's "British Carpenter." Of more value and interest infinitely, however, is the fact that Price's treatise met the approbation of three other worthies, well known to fame. On the emblematical frontispiece to the work, in tablet form, the following commendation appears:—"June the 28th, 1733.—Having perused this Treatise of Carpentery, compiled by Mr. Francis Price, we think it a very useful and instructive piece, and as such recommend it to every one concerned in works of that kind.

N. HAWKSMOOR.
JNO. JAMES.
JA. GIBBS."

The first named was no other than Nicholas Hawksmoor, the pupil of Sir Christopher Wren; and the last, James Gibbs, the architect of St. Martin's and St. Mary-le-Strand. John James was the architect of the well-known church, St. George's, Hanover-square.

Among the plates of Price's work is a section of the timber work of the dome of St. Paul's, with part of its plan, showing the cone of brick-work within the dome and a section of the surmounting cupola. The drawing is marked as "taken in 1733." The whole of the plates in the book bear the names of "F. Price, delin.," and "Toms, sculp.," and are very well executed. In connexion with the plates and the descriptive letterpress, they are all marked alphabetically, and more singular still is the fact that the descriptive letterpress of each plate commences with an engraved initial letter from A to Z consecutively. No matter what letter marked the plate, the opening word of the descriptive letterpress of that plate began with the same letter. The only omission being the letter J. The letter I being repeated. Although the author includes X as the initial letter to the letterpress of the plates marked X., yet he was unable to find a word commencing with that letter that would answer his purpose, so he was driven to recommence with another letter of smaller dimensions inside the enlarged initial letter. Whether Francis Price carried out what he considered a system in this arrangement of his subject, or whether it may be put down as a whim, the reader may judge. There is a "Supplement to the British Carpenter" containing Palladio's Orders of Architecture, with ornaments of doors and windows, &c. The work of Francis Price, as a whole, is still a very useful one; but while Pain, Nicholson, and others have found a succession of new editors, bringing down their works and making them suitable to present wants, Price has not been so fortunate. "The British Carpenter" has, however, been used by many as a storehouse from 1733 to our day, and those who have been indebted to the work have rarely acknowledged their indebtedness.

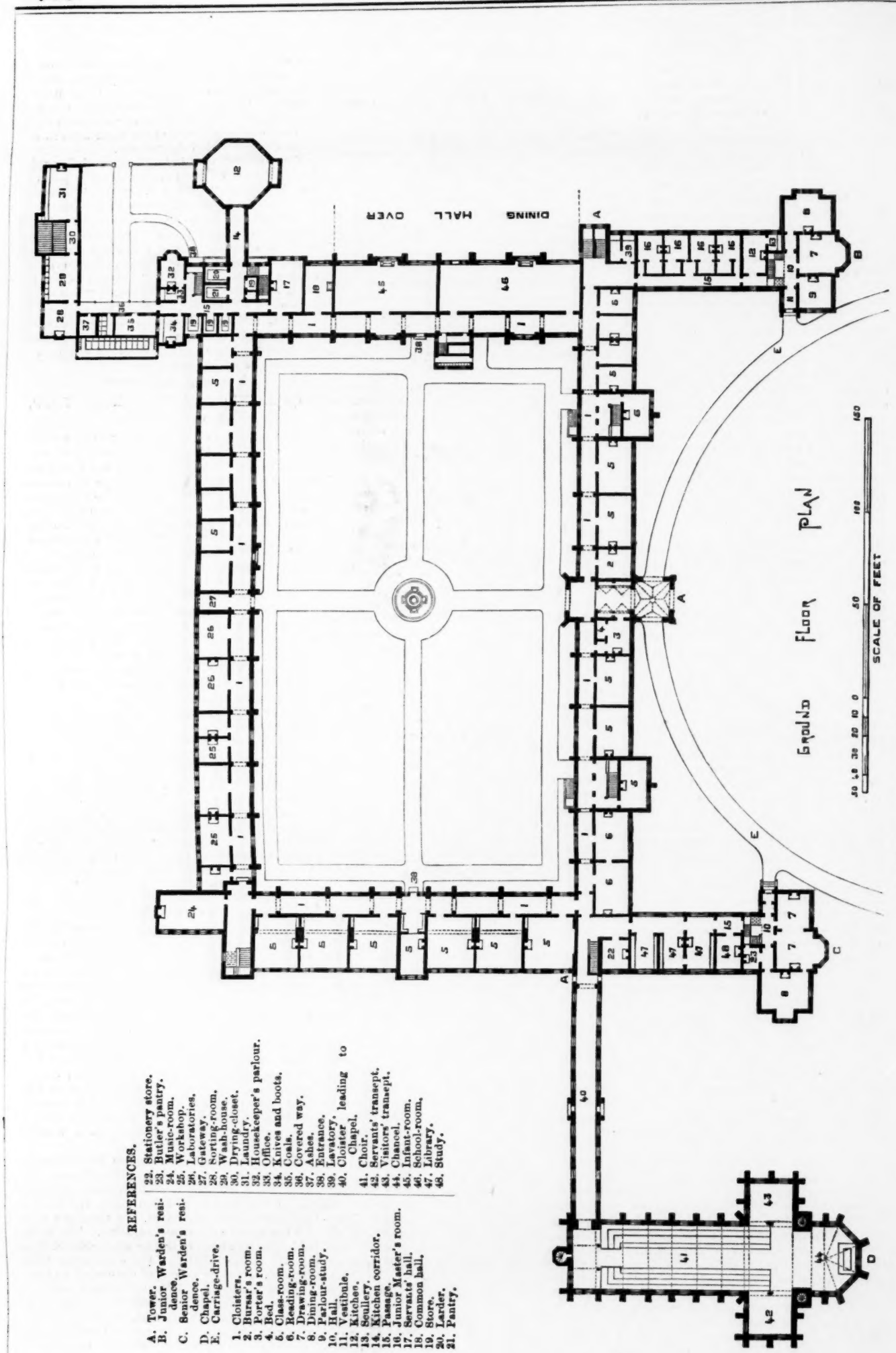
The trammel used in builders' workshops for describing an ellipse is called in many parts of the kingdom, "Price's Trammel." Though described in his work, it was in use before his day, if not in form, at least in principle. On the title-page of his volume our author is described as "late surveyor of the Cathedral Church of Salisbury, and author of a series of observations on that admirable structure." Though we find the name of "Price's British Carpenter" mentioned in several directories, we have been unable to discover any but the most scant particulars of the life and practice of the author, who, from his constructive designs, deserves the title of architect as well as surveyor.

COLLEGE OF ST. PAUL, KNUTSFORD, CHESHIRE.

THIS building, which we illustrate by a general view, and plan of the ground-floor, and of which the Lord Bishop of Chester laid the foundation-stone on the 24th instant, is now in course of erection on a site well adapted to the purpose, and 40 acres in extent, about two miles from the quaint old town of Knutsford, and distant sixteen miles from Manchester. The college is intended to afford a first-class education in accordance with the principles of the Church of England, and on the models of the great schools at Winchester, Harrow, &c., and will accommodate 500 students and 24 resident masters. Reference to the engravings will show the accommodation afforded in the ground-story. The first floor is mainly devoted to seventy studies of various dimensions; the dormitories for the junior students, with a window between each pair of beds, and with lavatories at the ends; and the dining-hall, a noble room, 130 ft. long and 35 ft. wide, with an open-timbered and boarded roof. On the second and third floors sleeping accommodation is provided for the remainder of the students, each having a cubicle with a separate window. The arrangements for water-supply, ventilation, hot and cold baths, are understood to have been well considered. A cloister with traceried windows and buttresses runs round the quadrangle, and affords easy access to the various rooms on the ground-floor. The central tower is 24 ft. square at the base, and is upwards of 170 ft. high, and the lower story, being open on all sides, will form a handsome entrance to the building.

The materials employed are deep red bricks, tuck pointed with black mortar, for the external walls, and for the inside cloister, tower staircases, and the upper portion of internal walls of dining-hall; the staircases and landings being fireproof. The lavatories are lined with glazed tiles, as also the kitchen, larder, and other parts. The architectural features of the fronts, including the panelled parapets, are of red brick, together with the labels, strings, and devices. Very little stone is used, and that is of red colour; and the roofs are to be covered with dun-coloured tiles. The whole of this part of the work is from the designs, and is being carried out under the superintendence, of Messrs. Pennington & Bridgen, of Manchester, architects.

To Messrs. Goldie & Child has been entrusted the erection of the chapel, which is connected with the college by a cloister, 150 ft. long, and is on the plan of a Latin cross, the head of which forms the sacrarium, the transepts being for the use of visitors and servants. The belfry, of brick and stone, over the choir-arches, rises to a height of 120 ft.; the choir itself being vaulted. At the west end of the chapel, and over the ante-chapel, is a lofty triforium, forming an organ-chamber. The internal fittings are to be of the most ornate character, the seats being of richly-carved oak, the pavement tesselated, and granite shafts being freely used in the arcading and piers of the great arches. The materials, externally, will be red brick, to accord with the college buildings, with dressings of stone. We may be able to illustrate the chapel, on a future occasion. It is expected that the buildings will be completed by Christmas, 1874. Mr. William Southern, of Manchester, is contractor for all the works: the contract for the college being 36,000*l.*, and for the chapel, 14,000*l.*



REFERENCES.

A. Tower.
B. Junior Warden's residence.
C. Senior Warden's residence.
D. Chapel.
E. Carriage-drive.

1. Cloisters.
2. Bursar's room.
3. Porter's room.
4. Bed.
5. Class-room.
6. Reading-room.
7. Drawing-room.
8. Dining-room.
9. Parlour-study.
10. Hall.
11. Vestibule.
12. Kitchen.
13. Scullery.
14. Kitchen corridor.
15. Passage.
16. Junior Master's room.
17. Servants' hall.
18. Common hall.
19. Store.
20. Larder.
21. Pantry.
22. Stationery store.
23. Butler's pantry.
24. Music-room.
25. Workshop.
26. Laboratories.
27. Gateway.
28. Sorting-room.
29. Wash-house.
30. Drying-closet.
31. Laundry.
32. Housekeeper's parlour.
33. Office.
34. Knives and boots.
35. Coals.
36. Covered way.
37. Ashes.
38. Entrance.
39. Lavatory.
40. Cloister leading to Chapel.
41. Choir.
42. Servants' transept.
43. Visitors' transept.
44. Chancel.
45. Infant-room.
46. School-room.
47. Library.
48. Study.

COLLEGE OF ST. PAUL, KNUTSFORD.

COLLEGE OF ST. PAUL, KNUTSFORD, CHESHIRE.—MESSRS. PENNINGTON & BRIDGEN, ARCHITECTS.

THE SWIMMING-BATH AT WARWICK.

THE operations connected with the construction of the bathing-place in St. Nicholas-meadow are completed. The dimensions of the bath are 240 ft. in length by 40 ft. in breadth; at the shallow end, the depth is 2 ft. 6 in., and at the deep end 7 ft. The bath is inclosed on either side by embankments, varying from 9 ft. to 10 ft. in height, and planted with evergreen shrubs. These effectually prevent bathers from being overlooked. The entrance to the bath is diagonal. On the river side the bath runs parallel; and on the land side it is also parallel for the greater portion of its extent, but the extremities are narrowed to the sluice-gate and to the exit into the river to prevent accumulations of mud and silt. Two flights of brick steps, built opposite to each other in the middle of the bath, where the depth is 4 ft. 6 in., serve at once for easy ingress and egress, and indicate to non-swimmers the greater and dangerous depth which lies beyond. There are also two smaller flights of steps on the land side at the shallow end; and it is proposed to place a flight of wooden steps at the deep end. The floor of the bath is lined with a thick bed of gravel, and for a considerable distance from the shallow end concrete grouting is added, so as to afford a non-yielding and agreeable foothold to bathers. The walls of the bath are concrete, and vary in thickness from 4 ft. to 5 ft. at their base to 18 in. at the top. Between 500 and 600 cubic yards of concrete have been used in the construction of the walls; and in the excavations for the work between 3,000 and 4,000 cubic yards of earth have been displaced. The labour account amounts to 330*l.*, out of the original estimate of 450*l.* Difficulties with the soil, drains, and wet weather occurred. For cleansing out the bath a sluice is provided at the upper end of the bath, and a well at the lower end, near the exit, which is 8 ft. in width, to allow swimmers to go out into the river at specified hours of the day. The whole of the work, from the preparation of drawings to the personal superintendence of the workmen, has been carried out by Mr. E. Pritchard, C.E., the borough surveyor. As to cost, it is expected that the original estimate will be exceeded by about 50*l.* Towards the 500*l.* required there is a legacy of 200*l.* left by the late Mr. Richard Greaves; 50*l.* added by his widow; and 100*l.* given by Mr. Alderman Dale.

THE SOIL OF ST. GILES'S.

DR. ROSS, in his annual report of the vestry of St. Giles, Bloomsbury, says,—"The soil on which the district lies is a breadth of gravel, with occasional patches several feet deep of clay-loam resting upon it. The gravel commences at the north, near Tavistock-square, and on the east by an oblique line through Woburn-place to Brunswick-square, where the London clay crops to the surface. On the south it extends, getting deeper as it falls, to the Strand; and on the west it runs through Marylebone and Kensington, where it is mixed with clay, to the suburbs. Supposing such a site to be in its natural state, it would be difficult to conceive one better adapted to promote the health of persons living upon it. The stratum of gravel, taking all the surface drainage, polluted though it might be by animal excrement and decaying vegetation, would purify it as it percolated through; and, by giving it rapid passage to the lower stratum, would prevent the dampness of the air, which is caused by exhalations from earth soaked with moisture, and from stagnant pools. St. Giles's should thus have a dry, pure, and temperate atmosphere, as compared with those parts of London which rest upon a cold, wet, retentive clay soil. Unfortunately these advantages have been well-nigh destroyed. In order to make suitable roads and sewers, the gravel has been overlaid many feet in depth, with a 'made' soil consisting of old brick rubbish and black earth saturated with the leakage from gas-pipes, brick-sewers, and cesspools, through which the local surface drainage cannot readily penetrate. The sewers are usually carried to a great depth, and inasmuch as it has been the practice until the last year for the contractors to cart away the gravel dug out of the trenches, and to fill in with rubbish, the filtration through the gravel has been arrested, and our beautiful squares, surrounded on all sides by sewers and a made soil, are liable to become damp from retaining an undue quantity of water. Your board, seeing this evil, has wisely ordered that the contractors shall fill in the trenches in future with gravel." And it is to be hoped that this order will be rigidly adhered to.

LIGHTNING AND LIGHTNING RODS.

A PAPER on this subject, read before the Meteorological section of the Franklin Institute of Pennsylvania, is being printed in the Journal of the Institute. We extract the following from a part of it already published:—

The closer rods are applied to the walls of a building the better; indeed, it is absolutely necessary to attach the rod directly to the object to be protected, to insure safety, for in no other way can we guard against the return stroke, which kills more people and destroys more property than the direct stroke.

The rod must not be placed at a distance from the object to be protected, nor pass over nor through rings of glass or other insulators. Insulators are not only useless but are positively dangerous before rain falls; after rain falls they acquire some degree of conducting power; at best, they are entirely useless as a means of safety, make an insecure fastening and allow the rod to rattle sufficiently to disturb sick or nervous people at all seasons of the year. Their use should be discontinued, and some method taken to induce parties, having rods upon their buildings which are insulated, to remove the glass. It is a physical impossibility for any object to be injured by lightning if the conditions of safety, known to be demanded, are fully complied with.

NEW REREDOS IN CARLISLE CATHEDRAL.

THERE is now being erected in Carlisle Cathedral a new reredos, from the designs of Mr. Street, R.A., in place of the blank wall and screen which formerly stood behind the communion-table. It is built on what appears to be the foundation of the old screen or reredos. This crossed the choir one bay west of the east wall of the choir, leaving a passage-way connecting the north and south aisles. The design of the reredos has been of necessity so made as to avoid as much as possible any interference with the east window, on which so much of the beauty and effect of the choir depends. It consists of an arcade of five divisions in the centre above the altar, and of a simpler arcade of three divisions on each side. The centre arcade has trefoiled arches, with gablets above, finished with figures of angels; the panels are to be filled up with mosaic. The arcades on each side of the centre have their panels filled with inlaid marble. The crossing of the arches is very much after the fashion of that in the early arcading in the choir aisles. It is the intention of the Dean and Chapter to erect screens of corresponding character on the north and south sides of the altar, and open traceried oak screens under the other arches between these and the choir stalls, and to lay down new pavement in the choir, as well as to erect a new bishop's throne. The reredos has been executed by Mr. Earp.

GLASS GROUND BY STORMS.

SIR,—At the fishing village of Boulmer, on the Northumbrian coast, I have just seen an instance of the power of wind [sand] to obscure glass. My attention was drawn by the occupier of a house here to the severity of the climate, when he pointed to one of his windows, and showed me that some of the panes of glass in it were completely obscured or "ground" by the action of the wind and sand blown against them. The obscuration is so complete, that when a pane was broken, and a glazier came to replace it, he exclaimed, "I did not know you wanted ground glass, I have only brought it clear." "Never mind," said my informant, "the wind and sand will soon obscure the new pane." The window has a south-eastern aspect, and the house is placed at the edge of low cliffs, the basaltic rocky seashore being at their bases. The panes presented various degrees of obscuration, according to the period since which they had been inserted, some being new and clear, others partially "ground," and others totally so, by the action of the wind and sand.

I should note, that what little sand there is on this rocky shore is composed of porphyritic or basalt rocky particles, which may account for its power of obscuring glass. [The "sand process" accounts for it.]

Have any of your readers met with any similar instance of the power of wind to obscure glass?

F. R. WILSON.

THE NEW TOWNHALL FOR WELSHPOOL.

IN consequence of frequent complaints being made by her Majesty's judges of assize, of the very inefficient accommodation afforded by the courts erected at Welshpool, in 1835–6, and after many attempts to remedy the same, plans were drawn up by Mr. Benjamin Lay, of Welshpool, architect, and submitted to the county magistrates in 1869, asking their approval and co-operation, which was granted, but on being placed before the corporation for confirmation, they were rejected. In consequence of further complaints from the borough justices in 1873, amended plans were drawn by Mr. Lay, who was requested by the corporation to act as architect; these plans were submitted, by the mayor, to the county magistrates, and were approved of; they agreed to assist in the matter; the contract for the building was let to Mr. Richard Price, of Shrewsbury, builder, for the sum of 6,255*l.*; Mr. William Johnes, of Welshpool, was appointed clerk of the works, and the first stone has just been laid.

The new town-hall, into which a considerable portion of the old building, left undemolished, will be incorporated, is to be constructed in the Classic style of architecture. The principal entrance, which will be from Broad-street, the artery of the town, it is intended to surmount with a tower 90 ft. high, having a four-faced clock at an altitude of 70 ft., to be illuminated at night. Fronting upon Broad-street there will be a corn market, 38 ft. by 37 ft.; and on the Hall-street side a general market will extend the whole length of the building each way, occupying the old chapel site at the back of the corn market. The total market area will be 4,556 superficial feet, besides which are the County Prothonotary Offices, with ante-room attached, cells for the prisoners at assizes, with direct communication with the dock, and ample sanitary provision. To the second floor, which is given up to the court and townhall, the approach will be from the stone staircase erected a few years back, the upper portion only being altered to make a straight flight of stairs. The assize court is to be 40 ft. by 54 ft., the grand jury room, 25 ft. by 30 ft., with a chamber for the petty jury, and a judges' retiring-room, 18 ft. by 17 ft., and an assembly-room, 80 ft. by 36 ft., supplemented by a refreshment-room at one of its ends, measuring 29 ft. by 13 ft. In addition to the Broad-street entrance, admission will be obtained by other doors in Hall-street. In the basement there will be an area of 4,364 superficial feet as vaults, ingress to which will be given from Hall-street, and on the attic floor are to be provided a kitchen and scullery, having a lift from the ground-floor for convenience on the occasion of entertainments. The remainder of this floor is set apart for the hall-keeper's residence. The total cost, including everything, is estimated to be about 10,000*l.*

VITIATED AIR.

THIS subject is at present exciting special interest in France and Belgium. Gen. Morins has communicated a paper to the French Academy of Sciences on the cubic space necessary to secure the salubrity of inhabited places. Professor de Chaumont had, in 1867, published a pamphlet entitled "On Ventilation and Cubic Space;" and, some time before, M. F. Leblanc had made a series of experiments on the composition of confined air. From these two sources Gen. Morins endeavours to deduce some useful rules for improving the sanitary condition of civil and military buildings. M. de Chaumont remarks that the impression produced by foul air on the organ of smell appears to be in direct proportion to the carbonic acid contained in the former; and that this gas ought not to exist in a larger quantity than six ten-thousandth parts of a given volume of air, to render the latter fit for breathing, since in that proportion there is no perceptible smell. Now, chemists admit that, in its natural state, the atmosphere does not contain more of that acid than the above fraction, which may even be a third less. On the other hand, experience shows that an ordinary man exhales 88 gms. of carbonic acid per hour, which, by converting this weight into volume, answers to two hundredths of a cubic mètre. But besides

this gas, aqueous vapour is likewise evolved in the proportion of more than a hundredth; so that, at the lowest, the total quantity of gaseous matter evolved by a healthy man is three hundredths of a cubic mètre. Calculating on this basis, General Morins finds that, the larger a room, the less will be the air to be renewed, and conversely. A bedroom for one person ought to be five mètres long by four in breadth, and three in height; but if inhabited by more than one, the causes of infection increase, even when the air is often renewed. Hence the ventilation should be constant, and amount, for the size alluded to, to 540 c. m. per hour.

Some interesting experiments were tried the other day in the citadel of Namur, under the direction of a detachment of Belgian engineers, several mining and civil engineers being also present. The experimenters were furnished with reservoirs of air supplied from the outside by force pumps, and were engaged in work in galleries filled with smoke or noxious gases, and were enabled to work without inconvenience, while animals placed in the same galleries along with them died of asphyxia.

NEW YORK DOCKS *v.* LIVERPOOL DOCKS.

THE *New York Nautical Gazette* makes a comparison of British with American building-workmanship which it is worth while to quote. The editor says:—

"One of the largest steamers afloat once ran against the stonework of the Liverpool docks, and her bow was slewed hard-a-starboard for her pains. Another steamer tried the stone-work of those piers, and has never recovered the shock. The piers were unimpaired, which speaks volumes in favour of the character of the mason-work performed on these structures. Here in New York we have what is termed a Dock Commission, who have on hand the important task of repairing and rebuilding our piers, and improving them. They have for some three years been engaged in building a stone pier on the North River, near the Battery, which was promised, when completed, to be unequalled, and so far they have kept their word. There is nothing like it in the world, except, it may be, the adobe or mud houses in Mexico.

On Tuesday last a large Transatlantic steamer, with her anchor under-foot, and going at the rate of perhaps one mile an hour, took a shy at this impregnable mess of masonry, and the result was the ship was entirely unhurt, while the pier was sent flying in all directions. The large stones, having little or no cement between them, were tumbled over, and about 75 ft. of the face of the pier was canted in-board, necessitating an expenditure for repairs of 25,000 dolls., at least. Excepting some sand, there was nothing to back up the stone front, or resist a pressure, and a view of the wreck will convince any one at a glance of the miserable character of the mason-work performed by this Commission."

ANCIENT WALL-PAINTINGS, CIRENCESTER.

AT the recent meeting of the Wiltshire Archæological Association, mentioned elsewhere, Professor Church gave an account of discoveries recently made in Cirencester, and in the course of it said,—"During many recent excavations for building purposes in Cirencester, the interior decorations of walls have been found in great quantities,—in cartloads, I may say. The colours are still adherent to the plaster and concrete, but the designs are not greatly varied or of particular merit. A morone ground, with white lines and black border, commonly occurs; two excellent specimens of yellow leafage ornament upon a morone ground have been fortunately secured for the museum; one of these was found in Cricklade-street, the other in the Leauses. An imitation granite pattern is common. But the most interesting piece of coloured plaster-work bears upon it something more than an ordinary design, and I beg that this fragment may be carefully inspected in to-morrow's excursion. I am more particularly anxious that persons familiar with similar relics found in Pompeii and Rome should examine this specimen, since its genuineness has been called in question by one or two gentlemen, whose thorough acquaintance with such subjects I have reason to doubt. The object is an inscription in Roman capitals, forming a set of squared words, to which a much later origin than the fourth century had been assigned before the present discovery was made. The best archæological authorities who have seen the Cirencester example do not doubt its genuineness, while the circumstances of the find place its authenticity beyond suspicion: I beg to place these on record now. During the levelling of a garden in the New-road, Cirencester, many coins and Roman tiles were daily disinterred. Captain Abbott watched the operations narrowly; and one day had his attention called to a fragment of wall-plaster found in his presence by the ignorant workman employed there, who saw letters upon it. Captain Abbott washed it and showed it to me, and subsequently deposited it in the museum. It must be recollected that it was not sold by the labourer, and that no one had any interest in producing a forgery. The letters absolutely agree in form with those of the graffiti, or wall-scratchings of Rome and Pompeii, and run thus,—

R O T A S
O P E R A
T E N E T
A R E P O
S A T O R

PROPOSED NEW METROPOLITAN CEMETERY.

PLANS have been prepared for laying out and converting into a public cemetery for the south and south-west districts of London a piece of land containing about 40 acres, formerly composing the Norbury-hill estate. The site is in the parish of Croydon, but it is close to Streatham, and adjoins the high road from London to Croydon and Brighton. The soil is loam, and water is found at a depth of 12 ft., but the land can be drained into the sewerage system of the Croydon district. Some opposition has been made to the proposal by residents of the district partly on the ground that the distance from the nearest dwelling-house is only 30 ft. from the boundary of the site, and a meeting is to be held next week at the Croydon townhall to hear objections.

THE DISCOVERIES ON THE PLAINS OF TROY.

THE correctness of the statements we published, doubted by a correspondent, is confirmed by the fact that Dr. Schliemann is charged with not sharing the results of his excavations with the Ottoman Government, as agreed on. The *Levant Herald* says:—"It is bad enough that the Ottoman Government should have been defrauded of its due, but it is far worse that that fraud should have been practised in the name of science; for not only will it render the Turkish Government excusably jealous and suspicious of archæologists, and thus close to these latter the very field in which they would most naturally desire to pursue their researches, but it casts a slur upon science itself, by making its name a cloak for deception, and degrading its pursuit to the level of a predatory traffic." We join in no condemnation of Dr. Schliemann, as the facts are not before us.

DEFENCE OF SHAMS.

SIR,—I am no purist, and I have faith in shams! The statement is, I am aware, a little shocking and abrupt. It would, no doubt, have been more politic to have allowed my heterodoxy to be gently evolved from the context, when perhaps the number of my dissentients might have been diminished by the cogency of my reasoning. But I have advisedly chosen this initial confidence because I desire to leave myself the fullest freedom of speech hereafter. "I know I am a villain, and I glory in it," is said to be the first exclamation of the hero of the melodramatic stage; and the fault is now yours, my reader, for continuing to read, not mine for writing, if what follows offends your orthodoxy.

The Vienna awards have been made, and the result shows that we have been miserably beaten in all matters of taste by France, Germany, and Austria; that, as a contemporary remarks, "in point of art manufactures, twenty-two years of teaching since the Exhibition of 1851 have not placed us in the position which we should occupy, and we must look to other schools for the culture we require." The truth is, the doctrine of the purists in decorative arts *years ago* led its disciples into a region so sterile, barren, and unattractive that they in despair and disgust broke loose from all restraint, and blindly rushed back into a quagmire which has engulphed them. The whole history is a see-saw played by children, and the highest purposes of art would seem to have been mistaken or overlooked by both parties.

Art is Nature's handmaid, and her mission is to beautify. In love and war, we are told, all means are fair. Can it be less so in art, since her highest object is to soften the asperities of every-day life, and to develope thence all possible beauties in the material, intellectual, social, and moral worlds.

Adam and Eve had for personal adornment neither "pannier," "chignon," nor paint; and their country residence, we have reason to believe, was innocent of "modern improvements." They were, says Carlyle, "two hairy, naked, or fig-leaved human figures; uncomfortable dummies, gasping and gesturing with painful pantomime and interjection;" and I unblushingly confess to the belief that our beaux and belles, their descendants of the nineteenth century, are more attractive, despite the cunning artifices of modern tailors, dressmakers, and milliners, in the gilded saloons and art conservatories, those shams of our luxurious civilisation, than our first parents, though innocently unadorned in their primeval garden of unsophisticated nature.

The objection to the chignon is not that it is "false" hair, but that it is a beautiful material wrought into forms ugly in themselves, and at variance with its natural growth. As an adjunct of dress, it is as legitimate as any other ornament, and certainly as appropriate for its position; nor is any greater violence done to nature in adding to her deficiencies than in pruning her exuberance. The objection to lily powder and rouge is not when they deceive (for that is the end and aim of all personal adornment), but when they *do not*; not when they add an illusive beauty to the human face, but when, in the unskilled hand of the novice, they destroy its natural charms, or bring out with the emphasis of strong contrast of colour and form the crude features they were intended to veil. The day may come when none of these aids to nature will any longer be necessary, when universal loveliness will prevail, and there will be no higher excellence to counterfeit. The writer does not expect to see that age, nor does he hope to outlive the day when indifference to personal defects or deformities shall be considered a virtue, or the desire to please a vice. The objection to "false" jewelry, which in these days is unsurpassed in richness and elegance of design by anything in the precious metals, is not that it is a "base imitation," without intrinsic value, but that, being cheap, it is worn with so much ostentation and so little taste. Labour can ennoble iron as well as debase gold, and the sin against art and good taste is not the imitation of superior in inferior materials, but the neglect to develop in each the greatest amount of beauty and utility of which it is susceptible. Those who, by deceiving the senses, give pleasure to the mind and elevate it, are true artists and benefactors to mankind. If, with a little paint and "Dutch metal," you can transform my humble dwelling into the likeness of a Mayfair mansion, I am so much your debtor. If my cement looks as well as your stone, lasts longer, and costs only half the money, I am that much in pocket and can bestow something in charity. If my paper looks as well as your paint, and being varnished lasts as long, I shall not quarrel with the difference of cost. If my chromolithographs are so perfect in execution that they rival your paintings in beauty of colour and drawing, I need not envy you your possessions, and I may reasonably rejoice in the knowledge that I am encouraging a "sham," which as a cheap substitute for paintings wholly outside the reach of thousands, who have nevertheless the knowledge and taste to appreciate and the desire to possess them, is destined to cover the grim, blank walls of many a home, that might else for ever remain the pictures of soul-depressing gloom, with the spirit-stirring sunshine of pleasant fancies, and to carry the refining influence of the highest art into the humblest dwellings. Since my bouquet of linen flowers is so masterly an imitation of nature, her beauties and her *blemishes* that the closest observer will fail to detect the deception, I am scarcely disposed to barter their perennial freshness for the fleeting charms of those of

your costly conservatory, and I shall continue to class the manufacture of these things amongst the most beautiful of the fine arts.

It may not be very gratifying to your millionaire to find that the tables of his butcher and his baker "groan" as heavily under electroplate as his ancestral "board" is wont to do under massive gold and silver, but the greatest of modern shams, the art of galvanic deposition, is to the masses not the less on that account a vast amelioration of domestic life. The fact is, the glory of modern civilisation *is* its counterfeit presentments. It is the more general distribution of God's gifts through the much-reviled shams of art and science that *is* the humanising influence of the nineteenth century. We have had in the past the arts of necessity, the arts of religion, and the arts of commerce; we have now to deal with the social and domestic arts, which include them all, and offer a field for the exercise of talents more vast and varied than all which has gone before.

C. HENRY WHITAKER.

COVERING STEAM PIPES.

A NEW covering for steam pipes, which is rapidly coming into use in the Saarbrücken mining district, has been patented by Herr Weiss, civil engineer. The following (according to the *D. Ind.-Zeit.*, from which we translate) is the method of applying it. A coat of thin loam wash is first given to the pipes, serving to prepare them for a more perfect adhesion of the composition to be applied. The mass used for covering consists of equal parts of loam or clay, free from sand, and brick dust, to which calves' hair is added. This, after being well mixed, is applied to the pipes in a hot state. For better securing the coating, wood splints, 10 in. long, ½ in. broad, ⅛ thick, are laid along the whole length of the pipes, and secured by thin iron wire. After drying, the loam wash is again applied till all the cracks have disappeared. The mass is then again put on till the pipes feel quite cool, which will be the case after laying it on to the thickness of from 5 in. to 5½ in. A coat of linseed oil and cement is finally given. The method described answers at present all requirements, the covering being perfectly air-tight, free from cracks, and not hygroscopic, the latter quality fitting it especially for pipes in the open air. The cost of the covering per foot of 8-in. pipe is 6d., while the expense of the old method amounted to nearly 8d.

THE WILTSHIRE ARCHÆOLOGICAL SOCIETY'S MEETING.

THE twentieth annual meeting of the Wilts Archæological Society was held on Tuesday, in last week, at the Town-hall, Swindon. Earlier in the day, a visit had been arranged to the Great Western Works at New Swindon; and at eleven o'clock a small party were guided over the factory by Mr. Carlton. At two o'clock in the afternoon, the Society assembled at the Town-hall, where a museum of antiquities had been formed.

The president, Mr. A. L. Goddard, on taking the chair, called upon the secretary, the Rev. A. C. Smith, who read the report for 1873; after which the president read an inaugural address. Mr. Richard Jeffries then read a paper on Swindon; its History and Antiquities; and the Rev. A. C. Smith one on Certain Wiltshire Traditions, Charms, and Superstitions. The meeting then adjourned to enable members to visit the churches and quarries, after which the Society dined at the Goddard Arms Hotel. The meeting then adjourned to the Town-hall, where an evening conversazione was held at which the Rev. Mr. Pleuderheath read a paper on Parochial Registers, and Mr. Cunnington one on Ancient Assessments. A paper on the Geology of Swindon was read by Mr. Moore, of Bath, and the Rev. A. C. Smith was called upon to read one on Wiltshire, Weather Proverbs, &c., but postponed it.

On the second day, a party of the Society started from the Goddard Arms Hotel about nine o'clock, and visited places mentioned in the president's inaugural address. The route was by Blunsdon to Cricklade, Latton, Down Ampney, and Maisey Hampton, to Fairford. Here the famous windows, respecting which so much has been said, were described by the Rev. J. Gerald Joyce, rector of Strathfieldsaye, and son-in-law of the Right Hon. and Rev. Lord Dynevor, vicar of Fairford. A picnic dinner took place in a tent erected in the paddock adjoining the churchyard. On their return, the party journeyed by way of Kempsford, Castle Eaton, Hannington (partaking of Mr. and Mrs. Hussey Freke's hospitality at Hannington Hall), and Stratton St. Margaret, to Swindon. The various objects of interest were fully described, and the excursion was much enjoyed.

In the evening, the Society assembled at the Town-hall, at eight o'clock, when the Rev. E. A. Fuller, vicar of St. Barnabas, Bristol, and late curate of Cirencester, read a paper on "The First Foundation of the Parish Church of Cirencester."

Professor Church then read a paper "On recent Roman Finds at Cirencester," of which we take separate notice; and after a brief interval spent in refreshment, the Rev. A. C. Smith read his paper "On Wiltshire Weather Proverbs and Weather Fallacies."

The members of the Society paid the ancient Roman city of Corinium a visit on Thursday. The day was fine, and a large party arrived by the 9·5 train, and Professor Church assumed the conductorship, after a passing glance at the museum. Afterwards luncheon was taken in the King's Head hotel, where a party of upwards of forty sat down, under the presidency of Mr. A. L. Goddard. On the conclusion of the repast, the president said that this was the last occasion on which the Society would meet together for the present year, and he said a few words before they parted. An adjournment was then made to the Corinium Museum, where, under Professor Church, a pleasant hour was spent, and the whole party returned to Swindon, having spent a very agreeable and instructive day at Cirencester.

DRURY-LANE THEATRE.

ON granting a new lease to Mr. Chatterton, the committee undertook repairs which had been the subject of much discussion, and the house has been overhauled and renovated. The sanitary appliances have received attention; all the lavatories, &c., have been taken up and refitted, and the drainage throughout has been cleared. Old vaults full of "properties" that had not seen daylight for many a long year have been cleaned out, and a good supply of lime and other disinfectants has been freely applied. The auditorium has been cleaned, the gilding touched up, the boxes have new crimson satin curtains, and are relined with a chintz. The works have been carried out by Messrs. Bracher & Son, builders, and Mr. Kershaw, decorator, under the direction of the architect to the committee, Mr. Marsh Nelson.

For Mr. Halliday's version of "Antony and Cleopatra," with which the house opened on Saturday last, some remarkable scenery and effects have been prepared by Mr. W. Beverly. *Cleopatra's* barge, founded on the description given by Shakspeare, is a lovely piece of colour, and nothing better of its kind than the naval fight has ever been done on the stage. Miss Wallis, the representative of the witching queen, although unable to realise the character in all its aspects, has taken at one step a good place in her profession.

THE LEICESTER FLOOD AND SEWERAGE SCHEME.

THE local highway and sewerage committee have reported that they have carefully considered the seven competitive schemes for improving the drainage and dealing with the floods and sewerage of the town, and are of opinion that the schemes submitted by Mr. J. B. Everard and Mr. Gant are the best considered, and the committee submitted the two schemes for the final decision of the council and award of premiums. They recommended the council to empower them to purchase (if the committee thought proper) one or more of the unsuccessful schemes.

Finally, the committee recommended the council to authorise them to retain the services, if desirable, of the successful competitor for the first premium, for the purpose of assisting the committee in perfecting a scheme and obtaining the necessary powers in the ensuing session of Parliament for dealing with the drainage, floods, and sewerage questions.

One of the town councillors (who were unanimously in favour of Mr. Everard's scheme) gave the following summary:—

"With regard to the two schemes before the Council, the one proposed by Mr. Everard, in his opinion, provided much more satisfactorily for the storm waters of the town than that of Mr. Gant. It also provided for an intercepting sewer, which would greatly relieve the present overcharged outfall. And one thing he deemed essential that Mr. Everard provided, and Mr. Gant did not, was the purification of the effluent water. If they did not accomplish that now, they would have to do it in the future. And seeing that Mr. Everard's plan was for 41,000*l.*, and Mr. Gant's 61,000*l.*, if they did the work proposed by Mr. Everard, they could then take into consideration the valuable suggestion of Mr. Gant to improve the river below the town, because they would then have 20,000*l.* they had not dealt with. Therefore he was a strong advocate of Mr. Everard's plan; the three important features in which were the storm-water sewer, the intercepting sewer, and the purification of the effluent water. These three were sufficient to give Mr. Everard's scheme the preference."

The Borough Surveyor, Mr. Stephens, said, with reference to Mr. Gant's plan, the Chairman of the Committee had not given it sufficient credit. The removal of the Birstall mill would improve the outfall 3 ft. 6 in., and that was a very important matter.

Alderman Ellis said Mr. Gant did not propose to carry out the Borough Surveyor's sewer. If it were the Borough Surveyor's scheme, he should go in for the removal of Birstall mill.

The Council unanimously decided in favour of Mr. Everard's scheme, and awarded the premium of 100*l.* in favour of Mr. Gant's, agreeing to the recommendations of the Committee, and referring the matter back to them to carry out to a successful issue as they may think desirable, and report to next meeting of Council.

THE TRADES MOVEMENT.

WHILE the ironmasters contemplate reducing the wages of the ironworkers, the nail-makers have put forth a claim for a 10 per cent. advance. In the event of the concession not being at once made the men of East Worcestershire, to the number of 25,000, will come out on strike. At a meeting of operative nail-makers already held at Bromsgrove it has been resolved to strike at once for an advance of 10 per cent. on present prices, the masters not having conceded the advance of which notice was given. A proposition to wait another week before striking was rejected by a large majority. It is expected a similar strike is about to take place in the Dudley district. There is also reason to fear that we shall witness serious disputes in the iron trade before many weeks are over. At the last meeting of the Wolverhampton ironmasters, a deputation from the Staffordshire ironmasters intimated that the conference had unanimously agreed that the wages of the ironworkers should be reduced after the 4th of October next. The proposed reduction was approved by the Wolverhampton ironmasters. A similar notification has been made to a meeting of ironmasters at Middlesbrough, who have also approved of it. So far from assenting to a reduction, the ironworkers are understood to be considering whether they ought not to demand a rise in their wages. ——A lock-out has taken place in all the shipbuilding yards in Bristol and the Bristol Channel, consequent on the refusal of the Shipwrights' Association to withdraw a rule which restricts the work to be done by each member to a given quantity.

SCHOOL BOARDS.

Newtown.—At the fortnightly meeting of the Newtown and Llanllwchairn United School Boards, the tenders for the erection of the new Board School, on the New-road, were opened and read. They were as follows:—

Williams	£2,070 0 0
Pryce	1,933 0 0
Burrel	1,745 10 0
Eaton	1,728 0 0
Morgan	1,715 0 0
Morris	1,584 10 0
Anwyl	1,567 0 0

The estimated cost, according to the original plan of Mr. Lay, the architect, was 1,250*l.* That gentleman was requested by the Board to explain the difference between his estimate and the tenders now sent in. Mr. Lay said this could be accounted for on the grounds—first, that the designs, as originally sent in, had been altered and improved, and consequently involved a heavier outlay. It was, in the second place, to be attributed to the increase in the price of labour, and in the advance of material. His own estimate was that the lowest tender would be about 1,500*l.* With regard to the disparity

in the amount of the tenders, this was always the case, and arose from circumstances which were explainable. He produced instances from the *Builder*, in which the difference between the highest and lowest tender was double. After some explanations, the tender of Mr. Morris, was accepted, subject to the approval of the Education Department. The terms were 1,584*l.* 10s., if with a slate roof; if with a tile roof, the contract to be 1,604*l.* 10s.

Burton-upon-Trent.—It was unanimously resolved to accept the design of Messrs. Giles & Brookhouse, of Derby, for the Victoria-road schools, and to award the premium of twenty guineas for second best design to Mr. Assender, of Swansea. Mr. Matthews was appointed to act with Messrs. Lowe, Warham, and Yeomans as the Building and Sites Committee, who are to carry out the plan of the proposed schools, subject to such variation in details as may appear necessary, and with the approval of the Board. The estimates laid before the Finance Committee for building and furnishing new schools amounted to 9,160*l.*, viz., Victoria-road schools, 5,625*l.*; Bond-end school, 1,550*l.*; Branstone school, 975*l.*; and Wellington-street infants' school, 1,010*l.* The outlay for the respective schools, Mr. Allsopp said, would be about 5*l.* 10s. per head for the accommodation provided.

"ARCHITECTURAL COLOURING."

SIR,—Will you kindly do me the justice to state that the drawings of Messrs. W. Perkin & Sons, of Leeds, and those of Mr. G. Hennell, of London, mentioned in terms of praise in your notice of the Roundhay Park competition, were coloured by me. I think you will acknowledge that an artist has a perfect right to claim whatever merit may be due to his share of the work—the terms, "sky washer," and "the fellow who colours our drawings," are, I hope, now passing away. I have done my best to combat them during a practice of some twenty years. I cannot help thinking a time will come when the architectural artist will take legitimate rank with the man who portrays the corner of a cornfield, or a few cows in a ditch.

W. RICHARDSON.

RAILWAY CONTRACTORS COMMITTED FOR MANSLAUGHTER.

THE coroner for Bolton has held an inquest touching the death of John Sixsmith, of that town, who was killed by falling into a railway cutting in course of formation by Messrs Knight & Pilling, contractors for the London and North-Western Railway Company.

James Bradley, brickmaker, said he was going home shortly before eleven o'clock on Saturday night, and when near to the railway cutting in Rothwell-street, he saw the deceased ahead of him. Perceiving that he had missed the footbridge over the cutting, witness shouted to him, "Wrong way." Before, however, he had got the words out of his mouth, deceased fell down the cutting—a distance of 18 ft. or 20 ft. He had passed through an opening in the palings which enclosed the cutting, and thence over a quantity of bricks. It was a dark night, and there was only one lamp there. Deceased was badly hurt, and died in a few hours.

Thomas Sharples, of the Park Inn, said the deceased left his house at half-past ten, and he was then perfectly sober.

Police-constable James Farish said, the fence had been broken for several days together, and witness had nearly walked into the cutting himself. He had complained of it three or four times to the contractors' servants, and once he believed to Mr. Knight himself. It was a road where there ought to have been a fire and a watchman.

Mr. J. Knight, superintendent of the works, said he had given instructions to two men named Smith and M'Cann to look to the fencing. No complaint was ever made to him personally about the fence.

M'Cann said he made the fence good at half-past five on Friday night. Shortly afterwards he found that two boys had pulled both railings down. He put them up again, and chased the lads away. On getting to work again on Saturday morning the railings were again down, and having to see after the barrows, &c., he did not attend to the railings again that day.

The jury returned a verdict that the deceased lost his life through the gross neglect of the contractors, Messrs. Knight & Pilling, in not providing proper fencing and light for the safe protection of the public.

The Coroner: That is a verdict of manslaughter.

The Foreman: That is our verdict.

Mr. Pilling is an alderman of the borough of Bolton.

PROPOSED NEW LIVERPOOL WATERWORKS AT WINDERMERE LAKE.

AN important new project has just been broached for giving an increased supply of water to Liverpool from Windermere Lake. It is scarcely twenty years ago that extensive new works for the supply of water to the town were constructed at Rivington, about twenty miles from Liverpool, under the superintendence of Mr. Hawksley, C.E., who designed the works. The water at these works is supplied in large quantities from the surrounding Rivington hills, and impounded in immense reservoirs, which, from their large dimensions, have been styled the Rivington Lakes. At the time these works were constructed it was believed that, with the existing well supply, they would be sufficient to furnish the inhabitants with water for an almost indefinite period; but it now appears that in consequence of the great expansion of the district, and the increase of the population, they are inadequate to the required supply; and at a recent meeting of the water committee of the corporation (to whom the works belong) the chairman stated that, taking into consideration the constantly increasing population, it was calculated that an additional 4,000,000 gallons per day would shortly be required, which the existing works could not possibly supply, and that new sources must therefore be looked to. He added that Windermere Lake was looked upon as the best locality to which the corporation could go; and he described the proposal for constructing new works there.

The heaviest portion of the proposed works would be a tunnel, commencing at the edge of the lake on the south side. This tunnel would be three miles in length, and, although a heavy piece of work, would be the only engineering feature of any great consequence in the undertaking. From the lake to Lancaster, a distance of about twenty-five miles, the water would be conveyed by natural gravitation, the level at Windermere being much higher than the line of country between that point and Lancaster. Commencing at Lancaster, there would be several pumping stations between that town and Liverpool. The first pumping station would be at Lancaster, where the water would be pumped to Preston. At Preston there would be another pumping station, the water being again pumped from that town, and also from other pumping-stations, in the direction of Liverpool until it reached that locality. There would be several reservoirs on the route between Windermere and Liverpool. The cost of pumping the water from Windermere and along the several intermediate points to Liverpool is estimated at two pence per thousand gallons. The distance between Windermere Lake and Liverpool is about eighty miles.

The ultimate decision of the corporation as to the proposed undertaking is not yet known. What, however, seems to be admitted as a certainty is the fact that the existing works are unequal to the water supply required, and that new sources in some direction must be secured.

Miscellanea.

The Sanitary Condition of Brentford.—At the Brentford police-court on Saturday, Miss Sargeant, the owner of a row of cottages in Cannon-alley, was summoned for allowing them to remain in a dilapidated condition, with no water supply, and insufficient drainage, the said cottages being unfit for human dwellings. The inspector of nuisances stated that on an inspection of the alley, on the 25th of August, he found that there was no drainage but that afforded by an open gutter; that the houses were in a very dirty state; that there were large accumulations of dust and refuse in the yard; that the pump was broken and could not be used; and that the houses themselves were in such a state as to be wholly unfit for occupation. A cesspool was only about 6 ft. from the water supply, and was full. In the cottages there were seven different families, and in six of these houses there were several children. The defendant's father, in answer to the summons, said there was an open space to each cottage, and he considered they were very healthy. He had done all he could to improve them. The inspector said they were very dilapidated, and dangerous to both life and health. The Chairman:—We shall make an order for abatement of the nuisance in seven days, and if it is not done we shall impose a penalty of 10s. a day for the nuisance, and 1*l.* a day as long as they are occupied.——A summons was then heard against G. J. Jenkins, the keeper of the Fox and Hounds, for having on his premises 105 pigs, which were a nuisance and injurious to health. The inspector said the pigs were only 12 ft. from the dwelling-house and thirty yards from the public street. The bench ordered the removal of the pigs within three months. These cases, it appears, are only specimens of a state of things for which Brentford has become notorious, and it is full time a clearance were made, both in pigsties and cottages.

Memorial Tablet of Dr. Arne.—A memorial tablet is about to be placed in the house in King-street, Covent-garden in which Dr. Arne, the composer of "Rule Britannia," was born.

Consecration of a new Synagogue at Manchester.—The new synagogue in South Manchester has been consecrated by the Chief Rabbi, and the *Jewish Chronicle* reports the proceedings. The building is situated in Sidney-street, Oxford-road. In six weeks a building there was adapted to the purposes of a synagogue. Messrs. I. Holden & Sons, of Manchester, were the architects, under whose superintendence and from whose plans the conversion of the old buildings (together with new erections) has been carried out. It is not large, yet, owing to the manner in which the space at disposal has been economised, the synagogue will accommodate about 200 persons. The ladies' gallery extends round three sides of the building. The reading-desk is surmounted by ornamented lamps. In front of the steps leading to the ark is a pair of three-light candelabra of bronze. The roof above the ark is formed of coloured glass of florated design. As light could be obtained only on two sides of the main building (excepting above the ark), the windows have been made of such dimensions as to give light sufficient for the whole interior. The building is illuminated by a sunlight in the centre panel of the ceiling. The cost will amount to about 3,000*l.*; towards this sum 800*l.* have been subscribed. The contractors are Messrs. Clay & Son, and Mr. Mark Froggart, of Manchester.

Carlisle Public Hall.—At a meeting of the shareholders in the Carlisle Public Hall Company, held in the town-hall, Mr. Vynne (the hon. sec.) read the report, which stated that, after carrying out the purchase of the site in Lowther-street, the committee procured plans from ten different architects, from which they at once selected two sets. One of the architects supplied estimates simply as such, the architects chosen (Messrs. Habershon & Brock) supplied ertimates a trifle less in amount, but with an absolute guarantee that the work should be completed for a sum not exceeding the total given, and taking upon themselves the responsibility of completion. The amount of capital at present subscribed for is something over 3,000*l.* The committee, in conclusion, applied for sanction to fix the nominal capital at 10,000*l.* Mr. A. Wheatley moved the adoption of the report; and, in doing so, mentioned that the large hall was intended to accommodate 1,338 on the ground-floor, and 668 in the gallery. Tenders would be advertised for and thrown open to the trade. The estimate was 5,400*l.* The report was unanimously adopted, and the nominal capital of the company fixed at 10,000*l.*

The Southampton Surveyorship.—Much difference of opinion appears to prevail among the members of the town council of Southampton, as to whether their surveyor, Mr. Lemon, should be allowed to have a consulting practice, or have his salary increased by 100*l.* a-year. The matter was not finally settled at the last meeting of the council, but an increase of 30*l.* on the salary of the assistant surveyor, Mr. Morgan, was agreed to. The propositions of Mr. Lemon, and the recommendations of the committee to whom the matter was referred, were as follows:—

"Propositions:—1. The Surveyor to have consulting practice out of the borough, the necessary staff for official work only to be provided by the Board. 2. To go back to the same arrangement as with my predecessors, viz., 250*l.* per annum salary; to be paid extra for all new works and all matters in connexion therewith, with private practice of all kinds without the borough. 3. Increase of salary on same conditions as to staff as in No. 1; three years' arrangement in every case.—The committee resolved unanimously that upon condition Mr. Lemon would agree to continue in his office as at present for three years at least from the present time, they recommended the Urban Sanitary Authority to increase his salary 100*l.* per annum. It was also resolved to recommend the increase of the salary of Mr. W. B. Morgan, the assistant-surveyor, 30*l.* per annum, and that Mr. Lemon be authorised to employ a clerk at a salary not exceeding 3*l.* per annum. Mr. Lemon stated that he accepted the condition relative to himself."

New Infirmary at Greenwich.—A new infirmary of large dimensions is about to be erected at Greenwich. The Local Government Board have just written to the Board of Guardians, forwarding the plans of the intended new building, which have been referred to a sub-committee of the Building Committee. It is stated that the cost, with furniture and fittings, will not be far short of 40,000*l.*

A Wilberforce Memorial.—A lady resident in Ryde has given the sum of 1,000*l.* towards building the chancel of St. Michael's Church, Ryde, as a memorial of Bishop Wilberforce. The foundations have been commenced, and the stone is to be laid on Michaelmas-day, in all probability by the Bishop of Winchester.

Fire at the Manchester Athenæum.—Manchester has narrowly escaped the loss of two fine public buildings, works of the late Sir Charles Barry. A fire was discovered in the Athenæum, Bond-street, on Wednesday last, and it was with difficulty extinguished. The Royal Institution, with its valuable art collection and exhibition, is only separated from the Athenæum by a very narrow street, but the flames were prevented from spreading in that direction. The destruction of the library of the Athenæum involves a serious public loss. It is asserted that the fire began at a gas sunlight illuminating the newsroom, though the precise mode of its commencement is not known. An iron tube conveyed the heated air from the sunlight to the outer air by way of the space between the ceiling of the newsroom and the floor above, and it is suggested that the joists or other combustible material in this space may have caught fire through over-heating of the iron pipe, or that an accumulation of soot in the pipe became ignited.

Report on Asphalte Pavements. — A report, in the form of a detailed table on the various kinds and quantities of asphalte laid within the city of London, has been prepared by Mr. Haywood, engineer and surveyor to the City Sewers Commissioners, and printed by their authority. There are now altogether 25 streets, or portions of streets, in the City, of which the carriage-ways have been paved with asphalte. One of the pavements has been down 3 years and 9 months, 2 for 2 years and 2 months, 18 under two years, 4 under 1 year, and 5 under 6 months, at the time of inspection. The most numerous portions have been laid by the Val de Travers Company, but seven other kinds have been tried, and the tabular report, with its numerous notes and remarks, is a valuable and important one, and should be looked to by all who are interested in the subject of roads.

Restoration of Lambeth Palace.—During the last three years the work of repairing and restoring the building of Lambeth Palace has been in progress, and will shortly be completed. It has been carried out by Messrs. Jackson & Shaw, at the cost of the Ecclesiastical Commissioners. The Lollards' Tower was found to be in a very dilapidated condition. The old roof has been removed, the flooring renewed, the old side-walls refaced with new stone, every stone and brick ascertained to be faulty taken out and replaced with sound materials, and the whole structure restored. The Gate Tower, erected by Cardinal Morton, about 400 years ago, has been restored in accordance with the designs of the founder. The library, the work of Sir Christopher Wren, has been attended to, the walls sounded and repaired, and the roof looked after. A stone on the building gives the date of its erection as 1685; but a leaden pipe attached to the walls, running from the roof to the ground, to carry off rainwater, bears the date of 1663.

Street Improvements in Birmingham.—Within the last six months alterations and improvements in some of the leading thoroughfares of Birmingham have been in course of completion, of such a nature as almost entirely to change the appearance of well-known localities. The effect of the alterations will be greatly to increase the somewhat scant architectural beauty of the town. It is in the neighbourhood of the Birmingham Town-hall where the greatest improvements are visible. Some two acres of old buildings, situated to the north of the Town-hall have been levelled with the ground, and the suite of municipal buildings, which are to cost nearly 100,000*l.*, have been commenced. These will, with the projected new assize courts (to follow in a year or two), form a fine crescent to the right of the Town-hall looking from the head of New-street. A new post-office has been erected immediately opposite the Town-hall.

Illegal Employment of Children in Brickfields. — At the Manchester County Police Court, Mark Whitehead, Walkden Moor, Worsley, has been fined 1*l.* and costs for emp'oying a boy under eleven years of age on a brickfield. John Whitehead, also of Walkden Moor, was fined 1*l.* and costs for similarly employiug a girl under thirteen years of age, and a like penalty for employing a boy under ten years of age. Messrs. Benton & Woodiwiss, brickmakers, Gorton, were ordered to pay a similar sum for employing a boy under thirteen years of age, without having obtained a certificate of his attendance at school.

Monumental.—The movement inaugurated some time ago, at Kidderminster, for a memorial to the eminent divine, Richard Baxter, appears to be progressing apace. An influential meeting, presided over by the Rev. G. D. Boyle, M.A., vicar, has been held in the Guildhall to finally decide on the sculptor for a statue to his memory. There were two sculptors competing, —Mr. Thomas Brock, of London, and Mr. F. J. Williamson, of Surrey,—and each supplied two designs for the guidance of the meeting. After a careful examination of the models, the model supplied by Mr. Brock was accepted. The figure will be 10 ft. high, and, with the pedestal, will stand 22 ft. from the ground. The pedestal will be made of granite, and the statue *per se* Sicilian marble.——A statue of the late Lord Dunkellin has been unveiled in Eyre-square, Galway.——An equestrian statue of "Stonewall" Jackson is to be erected in front of the Virginia Military Institute, at Lexington.

Gift of Messrs. Pease to Middlesbrough. At a meeting of the committee of the Middlesbrough High School, for the purpose of considering the desirableness of erecting suitable premises for the High School, Mr. J. W. Pease, M.P., produced plans by Mr. Waterhouse, of London, of a complete scheme for a large school in Middlesbrough, divided into two parts, the first consisting of buildings which would furnish the accommodation immediately required for a middle-class school. It was resolved that this portion should be proceeded with at once, and on behalf of the Middlesbrough owners Mr. Pease undertook to be responsible for the cost (at least 7,000*l.* or 8,000*l.*) of its erection. It was further decided that to make the institution thoroughly complete, and to furnish it, a subscription of at least 15,000*l.* should be raised, and towards this it was announced that Mr. Samuelson, M.P., and Mr. I. Lowthian Bell had each promised 1,000*l.*

The Town-hall, Brighouse.—This building has been closed for some weeks, for the purpose of being thoroughly cleaned, painted, and redecorated. The work has been done by Messrs. Hirst & Barraclough, painters and decorators. The ceiling and walls of the large hall are coloured in distemper, the panels in the ceiling being in neutral green, with margin and styles in cream, and a running border in lotus design in dark red to cut off the style from the panel the cornice running round the room being of a darkish stone colour, with the under edge of dark red. The panels on the wall are in light red, the styles being in stone colour. A Grecian key border in dark red is run around each panel. The seats have been stained and varnished, and the whole renumbered.

Working Men's College, Great Ormond-street.—The winter session of this College will commence on October 6th. The aim of this college differs considerably from most other evening educational institutions. It proposes to educate working men who desire culture for the sake of its influence upon their life and associations, and does not attempt to compete with the many valuable institutions which supply the technical instruction indispensable to intelligent artizans. The general meeting of council, teachers, and students, to which intending students and the public are invited, will be held on Thursday, October 2nd, at half-past eight. Canon Kingsley has promised to be present to address the meeting. The principal, Mr. Thomas Hughes, M.P., will preside.

Accident at St. John's Chapel, Pimlico.—At the fashionable chapel of St. John, in connexion with St. Barnabas's Church, Pimlico, a bricklayer in the employ of Mr. Haylock, builder, was on a forty-round ladder repairing the roof, when the ladder broke in the middle, and the unfortunate man was precipitated head downwards on to the flags in the chapel-yard. A fellow workman who was on another ladder beside him, close by, became so frightened that he fell off his ladder, but at a short distance from the ground, and was not much hurt. The other man was carried off to the hospital, apparently dead.

The Great Landslip in Peru.—According to the latest news from Matucama, the waters of the Rimac were flowing over the top of the dam, and also leaking from underneath. The excitement in Lima had abated, and it was supposed that the waters would gradually subside, and flow in their former channel after the lapse of a short time, as the river had opened itself a channel having a fall of 1 in 8.

Proposed Fruit Market, London.—At the Court of Common Council, a long and animated discussion took place with reference to the site of a new fruit and vegetable market. It was contended on the one hand that Farringdon Market, if rebuilt, with new approaches, would prove the best site; and, on the other hand, that the vacant land adjoining the new Meat Market was preferable. It was pointed out that the latter was close to the Metropolitan Railway, whilst the promoters of the scheme for utilising the present market attributed its failure to its inconvenience. Eventually the old site was chosen by a large majority.

Derby Memorial at Preston.—The ceremony of opening day and Sunday schools and a chapel of ease in connexion with St. Mary's, Preston, has taken place. The buildings (together with a contemplated church) have been erected as a memorial of the late Lord Derby, and the site for the whole has been given by the present earl, the value being nearly 4,000*l.* They are in the Gothic style of architecture, and have been built from designs by Mr. Hibberts, of Preston. The cost of the work, as far as at present completed, is 1,900*l.*

Rebuilding of St. Oswald's Hospital, Worcester.—The front part of this ancient hospital is in course of demolition, it having been decided to pull down the whole of the present dilapidated building, and erect a new structure, with increased convenience for the inmates. The work is under the superintendence of Mr. Rowe, architect, Worcester. The contractors are Messrs. Collins & Cullis, of Tewkesbury. It is contemplated to eventually rebuild the entire hospital.

German Sanitary Association.—A sanitary association for all Germany has just been formed at Frankfort-on-the-Maine, after two days' conference. Burgomaster Hobrecht, of Berlin, is chairman. Burgomaster Erhardt, of Munich; Dr. Lent, of Cologne; Privy Councillor, Varrentrapp, of Frankfort; Privy Councillor Wiebe, of Berlin; and Burgomaster Winter, of Dantzic, are members of the managing council. The Association has for its object the promotion of a sounder sanitary administration throughout the Empire.

Proposed New Church for Blandford.—A sum of money having been left in 1856 to endow a new church if erected before April, 1878, it has been resolved, at a recent meeting, to renew the attempt to carry out the purpose in view. A committee was appointed, and a site for the proposed church, or chapel of ease, has been suggested.

The Duplex Telegraph.—The American Institute of New York has awarded "the Great Medal of Honour" to Joseph B. Stearns for the invention of the duplex telegraph, which has made a revolution in telegraphy in the United States, and has been adopted by the Postal Telegraphs in this country.

Claridge's Asphalte.—We are bound by old acquaintanceship to mention that Claridge's Patent Asphalte of Seyssel Company, established in 1838, at Stangate, have removed from Parliament-street to the Institute of Surveyors, 12, Great George-street, Westminster.

Admiralty Director of Works.—Colonel Charles Pasley, R.E., was on Saturday appointed Director of Engineering and Architectural Works under the Admiralty, in the vacancy caused by the resignation of Colonel Sir Andrew Clarke, C.B.

The Projected Channel Tunnel.—The order for the opening of the *enquête* on the proposed submarine tunnel between Dover and Calais has been sent by the French Government to the *préfet* of the Department of the Pas de Calais, and the inquiry, which must be continued for forty days, will be opened almost immediately.

The New Reservoir, Margate. — The memorial stone of the new reservoir of the Margate and Broadstairs Waterworks Company has been laid. The reservoir is to meet the requirements of the increasing district of Cliftonville, and is calculated to hold some 300,000 gallons.

The Architect for the Louvre Library Reconstruction.—The internal reconstruction of the library at the Louvre, for which the National Assembly voted 700,000 francs, is confided to the superintendence of M. Lefuel, the architect.

The Houses of Parliament.—In consequence of the decay of the stone, scaffolding has been erected round the lesser spires, and repairs are being made. Where requisite new material will be introduced.

TENDERS

For rebuilding two warehouses, City (arranged so as to be divided into four if necessary). Mr. Herbert Ford, architect:—

Adamson & Sons	£7,829 0 0
Stimpson	7,697 0 0
Perry, Brothers	7,687 0 0
Crabb	7,595 0 0
Webber	7,558 0 0
Perry & Co.	7,425 0 0
Scrivener & White	7,420 0 0
Browne & Robinson	7,398 0 0
Killby	7,295 0 0
Brass	7,270 0 0
Anley	7,181 0 0
Downs & Co. (accepted)	7,095 0 0

For six shops, with residences and stables, for Baron E. de Gleichen Tettenborn, Clacton-on-Sea, Essex. Mr. G. Gard Pye, architect:—

Riches	£5,481 6 1
Shepherd	4,860 0 0
Clarke & Son	4,853 0 6
Hume (accepted)	4,223 11 10

For ale stores, &c., at the Cannon Brewery, Watford, for Messrs. L. G. Benskin & Co.:—

Chalk	£2,946 0 0
Foreman	2,550 0 0
Ford	2,339 0 0
Allen	2,023 0 0

For Newbury Cattle Market, Berks. Mr. James H. Money, architect. Quantities supplied:—

Whiter	£2,052 7 6
Groome	1,993 6 0
Simonds	1,973 0 0
Harrison (accepted)	1,841 12 0

For erecting a vicarage-house at Long Eaton, Derby. Mr. William Smith, architect:—

Wood, Brothers	£2,403 5 0
Bridgart	2,335 0 0
Thompson	2,277 0 0
Fast	2,150 0 0
Law & Sons (accepted)*	2,110 0 0

* Subject to sundry reductions.

For sundry works in restoring north and south porches, tower, &c., at Long Sutton Church, Lincolnshire. Mr. William Smith, architect:—

Warrick	£885 0 0
Bennett	860 0 0
Brown (accepted)	860 0 0

For villa residence, at Heath Park, Leighton Buzzard, for Mr. George Shrimpton. Mr. Frederick Gotto, architect:—

Smith & Fincher	£812 0 0
Whiting	760 0 0
Dawson	680 0 0
Horwood	649 0 0
Gibbs	640 0 0
Gibbons	625 0 0
Adams & Holdstock	607 0 0
Cook (accepted)	523 10 0

For the erection of two shops and residence, Green-street, Bethnal-green, for Mr. T. F. Bradbrook. Mr. William Mundy, architect. Quantities supplied:—

Larke	£3,444 0 0
Robson	3,308 0 0
Wicks & Bangs	2,754 0 0
Bishop	2,594 0 0
Thomerson	2,547 19 6
Chapman	2,539 0 0
Craaker, Brothers	2,534 0 0
Blackmore & Morley	2,518 0 0
Beale	2,515 0 0
Sheffield	2,498 0 0
Forrest	2,447 0 0
Langmead	2,390 0 0
Brown (accepted)	2,280 0 0

For the erection of sundry works at Kenley, for the Kenley Gasworks Company:—
Downs & Co. (accepted).

For the erection of warehouse at Norwood, for Mr. W. Stanley. Mr. W. Stanley, architect:—

Wagner	£1,750 0 0
Downs & Co.	1,585 0 0
Holliage	1,560 0 0
Smith	1,499 0 0

For repairs to the Green Man Public-house, and two houses adjoining, Camberwell:—

	Green Man.	Two Houses adjoining.
Brindle & Co.	£109 0 0	21 0 0
Sawyer	119 0 0	10 10 0
Hockley	107 0 0	14 10 0
Shurmur	105 0 0	15 0 0
Taylor (accepted)	98 0 0	15 0 0

For new savings-bank at Leicester. Mr. Edward Burgess, architect. Quantities supplied by Mr. L. C. Riddett:—

Lindley	£3,200 0 0
Major	3,152 0 0
Loveday	2,980 0 0
Osborne, Brothers	2,880 0 0
Butler & Marshall	2,875 0 0
Duxbury	2,803 0 0

For the erection of a house at Palace-gate, for Mr. H. F. Makins. Messrs. Stevenson & Robson, architects. Quantities by Mr. G. D. Tasfle:—

Cubitt & Co.	£8,615 0 0

For schools at Funtington, Sussex, for the School Board for Funtington. Mr. Lacy W. Ridge, architect. Quantities by Mr. L. C. Riddett:—

Poate	£1,343 0 0
Johnson	1,300 0 0
Bushby	1,185 0 0
Quick	1,147 0 0

For alterations and additions to 31, Stamford-street, Blackfriars, for Messrs. Evans & Wormull. Mr. Joseph Tanner, architect:—

Pitcher (accepted)	£690 0 0

For rebuilding the David's Harp Public-house, Fore-street, Limehouse. Mr. Williams, architect:—

Marr	£995 0 0
Anley (accepted)	988 0 0

For building workshops at 3, Gunpowder-alley, Shoe-lane. Mr. Parkinson, architect:—

Cook	£260 0 0
Anley (accepted)	244 0 0

For erecting schools for 200 children, and teacher's residence, for the School Board of South Tawton, Devon. Mr. Charles Pinn, architect:—

Parish	£1,933 0 0
Berry	1,880 0 0
Underhill & Ellis	1,797 0 0
Ellis	1,599 0 0
Gun & Stratford (accepted)	1,536 0 0

For erecting schools for 130 children, for the School Board of Drewsteignton, Devon. Mr. Charles Pinn, architect:—

Mardon & Sly	£1,350 0 0
Parker & Ball	1,326 0 0
Luscombe & Ellis	1,236 0 0
Aggett & Luscombe	1,225 0 0
Parker & Underhill	1,179 0 0
Stone	1,170 0 0
Underhill & Ellis	1,148 0 0
Berry	1,130 0 0
Parish (accepted)	9?9 0 0

For the erection of dwelling-house, stable buildings, &c., at Batch Wood, near St. Alban's, for Mr. E. B. Denison. Mr. E. H. Martineau, architect:—

Dove, Brothers	£21,000 0 0
Axford	20,875 0 0
Macey	20,720 0 0
Rider & Son	20,280 0 0
Ashby & Horne	20,170 0 0
Miskin	19,481 0 0
Jackson & Shaw	19,455 0 0
Hill & Sons	19,374 0 0
Longmire & Burge	19,190 0 0
Hailey	18,740 0 0

For villa residence, on the Crystal Palace Park Estate, Sydenham, for Mr. James Hendry. Mr. John Norton, architect. Quantities by Mr. J. S. Thacker:—

Steedingson	£5,498 0 0
Simpson	4,980 0 0
Harding	4,947 0 0
Jobling & Co.	4,943 0 0
Boyce	4,894 0 0
Keith	4,695 0 0
Garratt	4,675 0 0
Martin	4,298 0 0

For alterations at Bromley Palace, Kent, for the executors of the late Mr. Coles Child. Mr. Wm. C. Banks, architect:—

Arnaud	£744 0 0
Staines & Sons	718 0 0
Cooper	657 0 0

For villa residence, Carlton-hill, for Mr. G. Speedy. Mr. Jas. Miller, architect:—

Garrod & Smith	£2,968 0 0
Bridgman & Co.	2,879 0 0
Bird	2,750 0 0
Hunt & Son	2,650 0 0
Higgs	2,506 0 0
Gregory	2,298 0 0
Hyde	2,290 0 0
Ebbs & Sons (accepted)	2,273 0 0

For restoring Evershed's Candle Factory, Station-street, Brighton:—

Manwaring	£500 0 0
Nash	390 0 0
Colwell	330 0 0
Howick	310 0 0

TO CORRESPONDENTS.

Erratum.—The architect for the new bank buildings for Derby is Mr. *G. R. Isborn*, not "G. Risborn." Similar mistakes will often occur if care be not taken in *writing* the name.

J. S., *Mason* (will have to look to the proper books).—T. C. (we cannot assist).—F. C. (we have mentioned on several occasions the statements that echoes in buildings have been lessened, if not cured, by stretching wires from side to side of the apartment. The information obtainable is not at present very precise, but experiments are, we believe, in progress).—H. M. C.—J. O. P.—W. G. S.—H. L.—J. D. C.—E. R.—J. S P.—S. D.—J. D.—H. J. N.—W. M.—D. B.—W. B. & Son.—W. R.—J. G.—C. P.—S. & Co.—C. H. S.—T. B.—F. T. C.—J. M.—H. & Son.—F. C. (next week).—Technical Education (in type).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

SITUATIONS WANTED.—Advertisements of this class are inserted at the following rate, viz.:—

Six lines (about fifty words) or under ..... 2s. 6d.
Each additional line (about ten words) ..... 0s. 6d.
Halfpenny stamps accepted for amounts under 5s.

Bath and other Building Stones of Best Quality.—RANDELL, SAUNDERS, & CO. Limited, Quarrymen and Stone Merchants. List of Prices at the Quarries and Depôts, also Cost of Transit to any part of the United Kingdom furnished on application to
Bath Stone Office, Corsham, Wilts.—[ADVT.]

Bills of Quantities, Specifications, &c., Lithographed by ROBT. J. COOK & HAMMOND, 29, Charing-cross, S.W., with accuracy and punctuality. Plans and Drawings Copied, Traced, or Lithographed.—[ADVT.]

STONE BROTHERS,
Bath Stone Merchants,
supply direct from their own Quarries:—
BOX GROUND, CORSHAM DOWN,
FARLEIGH DOWN, COMBE DOWN,
AND STOKE GROUND.
Prices on application at Bath-stone Office, Bath.
London Depôt, G.W.R. Mileage Station, Paddington.
Stone Dressings prepared ready for fixing.[ADVT.]

GATES AND RAILINGS
MANUFACTURED BY
W. T. ALLEN & COMPANY,
LATE
TURNER & ALLEN,
ART FOUNDERS & CONTRACTORS,
No. 201, UPPER THAMES STREET,
LONDON, E.C.

A choice Selection of Designs can be had on application, or complete Pattern Book of Ornamental Cast and Wrought Ironwork, Lamp Pillars, &c. will be forwarded on receipt of 10s.

Special attention is directed to our Pattern-making and Carving Department, which is carried out on the above Premises.

CHARLES COLLINGE'S PATENT
COLLINGE'S PATENT HINGES.
Manufacturers,
MICHELMORE & REAP,
36, Borough Road, London, S.E.
Illustrated Sheet on application.

PERFECTION in BOOKKEEPING.—Builders and Others desiring a really good system, can have SET of MODELS for BUILDER'S BOOKS, by DOUBLE ENTRY, to which was awarded the prize offered in "The Builder," No. 1,180, and which has been adopted by many large firms. Also a Modified Arrangement by Single Entry, suitable for small builders.—Address, Mr. J. H. JONES, 2, Vine-villas, Sevenoaks.

THE ART-JOURNAL for OCTOBER,
(price 2s. 6d.) contains the following
LINE ENGRAVINGS:—
I. COMING FROM CHURCH, after J. F. PORTAELS.
II. ADORATION OF THE MAGI, after BONIFACIO.
III. JOCHEBED, after F. SIMMONS.
LITERARY CONTRIBUTIONS.

Halls and Castles of the Dee. By Dean Howson and Alfred Rimmer. Illustrated.
The Decorative Arts, as applied to Public Buildings.
The British Artisan at the Vienna Exhibition.
Amber and the Amber Fisheries. By P. L. Simmonds.
Trojan Art Treasures.
Exhibition at Philadelphia in 1876.
Ancient Stone Crosses of England. By A. Rimmer. Illustrated.
Venetian Painters. By W. B. Scott.
The Vienna Exhibition. Illustrated.
Birmingham Society of Artists.
Manchester Royal Institution.
Art at Home and Abroad. Obituary, Reviews, &c. &c.

*** The Volume for 1872 is now ready, price 31s. 6d. bound in cloth.
London: VIRTUE & CO. Ivy-lane; and all Booksellers.

RARE and VALUABLE WORK on FREEMASONRY.
Only copyright perfected Manual acknowledged by the Craft.
THE ACCEPTED CEREMONIES of CRAFT FREEMASONRY, as taught in all the Master Masons' Lodges of the Ancient, Free, and Accepted Masons of England, embracing the whole of the Craft Masonic Ceremonies, the Opening and Closing of the three Degrees. Questions to Candidates before being passed and raised, the Initiation, Passing and Raising, the Tracing-boards, &c.
Sent, post-free, on receipt of 8s. 6d. (or before remittance is made, if desired), payable to A. E. MASON (P.M. 30°), Bank Top, near Richmond, Yorkshire; or from ELLIOT STOCK, 62, Paternoster-row, London; or through any Bookseller. Prospectus free.

WORKS ON ART
BY MONSIEUR VIOLLET-LE-DUC.
Now being Published, in Parts,
LECTURES ON ARCHITECTURE.
By E. VIOLLET-LE-DUC.
Translated from the French, by B. BUCKNALL, Architect.
Complete in 2 vols. large 8vo. with numerous Woodcuts and Portfolio of Steel Engravings.
Price, £3. 10s.
Lecture I. now ready.
Publishers: Vve. MOREL & CIE. Paris; and CLARK, Stroud, Gloucestershire.
Subscribers' Names will be received by T. CLARK, The Library, Stroud, Gloucestershire.

H. DOULTON & CO. HIGH STREET, LAMBETH,

ARE PREPARED TO GIVE ESTIMATES

FOR EVERY DESCRIPTION OF TERRA COTTA,

And beg to call attention to the following as some of the Works executed by them :—

Royal Engineer Institute, Chatham (vide *Builder*, Sept. 6).
Colossal Statues, &c. &c. at South Kensington Museum.
Wellington Mills, Westminster Bridge-road.
Houses corner of Duke-street, Oxford-street.
Messrs. Grimshaw's Tea Warehouse, Sunderland.
Convalescent Home, Cheadle, near Manchester.
Houses in New-street, Birmingham.
New Chapel, Balham.

WHEN REQUIRED, ESTIMATES GIVEN TO INCLUDE FIXING.

PAINTED ART-TILES OF ORIGINAL DESIGN,

For Internal and External Decoration.

AN INSPECTION OF SPECIMENS IS INVITED AT THE SHOW-ROOMS, HIGH STREET, LAMBETH.

Messrs. DOULTON & CO. have obtained

FIVE MEDALS for PROGRESS and MERIT at the VIENNA EXHIBITION

FOR THEIR VARIOUS KINDS OF MANUFACTURES.

IMPERIAL FIRE INSURANCE COMPANY. Established 1803.
Old Broad-street, E.C. and 16 and 17, Pall-mall, S.W.
Capital, 1,600,000*l.*; Paid up and Invested, 700,000*l.*
Policies falling due at MICHAELMAS should be renewed before the 9th OCTOBER, or the same will become void.
E. COZENS SMITH, General Manager.

LOSS of LIFE or LIMB, with the consequent Loss of Time and Money, caused by Accidents of all kinds, provided for by a Policy of the RAILWAY PASSENGERS' ASSURANCE COMPANY.—An Annual Payment of 3*l.* to 6*l.* 5*s.* insures 1,000*l.* at death, or an allowance at the rate of 6*l.* per week for injury. 725,000*l.* have been paid as Compensation, one out of every Twelve Annual Policyholders becoming a claimant each year.
No. 64, CORNHILL, and 10, REGENT-STREET, LONDON.
WILLIAM J. VIAN, Secretary.

NORWICH UNION FIRE INSURANCE SOCIETY.
BONUS YEAR 1873-4. The Bonus allotted this year to Participating Policy-holders amounts to 57,428*l.*
The Bonus will be paid Michaelmas and Christmas, 1873; Lady-day and Midsummer, 1874.
Amount already allotted to insurers, 452,673*l.*
This Office is distinguished by its liberality and promptness in the settlement of claims, 2,751,792*l.* having been paid to Insurers for losses by fire.
In proof of the public confidence in the principles and conduct of this establishment, it will suffice to state that the total business now exceeds 100,000,000*l.*
No charge is made for policies.
Offices: 50, Fleet-street, E.C.; and Surrey-street, Norwich, 29th September, 1873.

GUARDIAN FIRE and LIFE OFFICE.
Head Office, 11, Lombard-street, London, E.C.
West End Office, 4, Whitehall.
Established 1821. Subscribed Capital, Two Millions.
DIRECTORS.
CHAIRMAN—James Goodson, esq.
DEPUTY-CHAIRMAN—Archibald Hamilton, esq.

Henry Hulse Berens, esq.
Hy. Bonham-Carter, esq.
Charles Wm. Curtis, esq.
Charles F. Devas, esq.
Francis Hart Dyke, esq.
Sir W. R. Farquhar, bart.
Alban G. H. Gibbs, esq.
Thomson Hankey, esq.
Richard M. Harvey, esq.
John G. Hubbard, esq.
Frederick H. Janson, esq.
G. J. Shaw Lefevre, esq. M.P.
Beaumont W. Lubbock, esq.
John Martin, esq.
Augustus Prevost, esq.
William Steven, esq.
John G. Talbot, esq. M.P.
Henry Vigne, esq.

SECRETARY—Thomas Tallemach, esq.
ACTUARY—Samuel Brown, esq.
N.B.—Fire Policies which expire at MICHAELMAS must be renewed at the Head Office, or with the Agents, on or before the 14th of OCTOBER.
The Accounts published under the "Life Assurance Companies Act, 1870," and the Company's Prospectus, give the fullest information respecting the state of the Company's affairs, and the terms on which Fire and Life Assurances may be effected.

PHŒNIX FIRE ASSURANCE COMPANY, Lombard-street and Charing-cross, London, established in 1782.
TRUSTEES AND DIRECTORS.

John Edward Bovill, esq.
Decimus Burton, esq.
The Hon. James Byng.
John Clutton, esq.
Octavius Edward Coope, esq.
John Coope Davis, esq.
George Arthur Fuller, esq.
Charles Emanual Goodhart, esq.
Osgood Hanbury, jun. esq.
Kirkman D. Hodgson, esq. M.P.
Sir John Lubbock, bart. M.P. F.R.S.
Charles Thomas Lucas, esq.
John Dorrien Magens, esq.
John Stewart Oxley, esq.
Benjamin Shaw, esq.
Wm. James Thompson, esq.
William Whitbread, esq.

AUDITORS.
John Hodgson, esq. Dudley Robert Smith, esq.
Walter Bird, esq.
SECRETARIES.
George William Lovell. John J. Broomfield.
Insurances against Loss by Fire are effected by the Phœnix Company upon every description of Property, in every part of the world, on the most favourable terms.
The promptitude and liberality with which its engagements are always met by this Company are well known; and the importance of its relations with the public may be estimated from the fact that since its establishment it has paid more than Ten Millions Sterling in discharge of Claims for Losses by Fire.
Insurances with this Company expiring at MICHAELMAS must be renewed within fifteen days thereafter, or they will become void.
Receipts are now ready at the principal Offices, Lombard-street and Charing-cross, and with the respective Agents throughout the United Kingdom.

THE NEW GAS COMPANY (Limited).
The Directors of the above Company are ready to receive APPLICATIONS from Owners of existing Gasworks, as well as from others erecting, or about to erect, new works, and to grant Licences for the use of the PATENTS.—Apply to the Secretary, No. 22, Walbrook, E.C.

THE INVENTORS' PATENTRIGHT ASSOCIATION (Limited) PROCURE LETTERS PATENT for Inventions at fixed and moderate charges, and affords inventors the aid of high-class scientific and legal advice when required. Handbook of information free by letter or personally, to Mr. T. MORGAN, Secretary, at the Office, 21, Cockspur-street, Charing-cross, S.W.

MR. EDWARD L. PARAIRE, Architect and Surveyor, begs to inform his clients, he has REMOVED his OFFICES to 474½, Oxford-street, opposite Messrs. Mudie's Library.

COURSES of ENTERTAINING LECTURES on SCIENCE, with abundant Illustrations and Experiments, OFFERED GRATUITOUSLY to Institutions for popular benefit in or near the Metropolis.
C. GOODMAN, Publisher, 407, Strand, having been appointed Agent in connexion with the Organisation for Free Lectures and Prize Examinations, is ready to RECEIVE APPLICATIONS for the ensuing season from Institutions able to command large working-class audiences, and will supply full particulars on application.

PERSPECTIVES
Rapidly and Artistically PREPARED,
COLOURED, or ETCHED,
for Competitions or Exhibition.
DESIGNS and WORKING DRAWINGS.
Terms Moderate.—Address, T. H. 14, Argyle-street, King's-cross, W.C

TO ARCHITECTS, BUILDERS, &c.
PLANS, WORKING DRAWINGS, SPECIFICATIONS, &c. accurately and expeditiously prepared. Surveying, measuring up work, &c. Terms moderate.—Address ARCHITECT, care of Mr. Forge, Stationer, 400, Euston-road, N.W.

DRAWINGS, TRACINGS, PARLIAMENTARY or WORKING PLANS and SECTIONS for RAILWAYS, TRAMWAYS, WATERWORKS, &c. Surveying and Levelling, by an ENGINEER, with fifteen years' experience.—Address, ENGINEER, Dodd's Library, 120, Fulham-road, London, S.W.

AN ARCHITECT who has lately commenced practice, and whose time is only partially occupied, will ASSIST any ARCHITECT or SURVEYOR in PREPARING DESIGNS, working drawings, details, specifications, and quantities. Address, Q. E. D. Post-office, Liverpool, till called for.

WILLIAM READ, 437, Brixton-road,
GRAINER, MARBLER, and DECORATIVE ARTIST.
Prize Medals awarded, 1851, 1862, 1870.
Graining, Marbling, and Decorative Work undertaken and promptly executed, in Town or country, on most moderate terms. Specimens at the Crystal Palace, near the High-level Station.

CHARLTON & MARTIN,
MARYLAND POINT, STRATFORD, LONDON, E.
CONTRACTORS for PAINTING, STAINING, DECORATING, RENOVATING, &c. Churches, Chapels, Halls, Offices, Chambers, and all kinds of Public, and other Buildings in Town and Country.

WANTED, a good SURVEYOR and DRAUGHTSMAN. Salary 2*l.* 2*s.* per week.—Apply, with particulars and specimen drawing, to Mr. JAMES RICHARDSON, C.E. 5, East Parade, Leeds.

WANTED, a CLERK of WORKS.—Apply, with testimonials (copies only, which will not be returned), to Mr. W. M. FAWCETT, Architect, Cambridge.

WANTED, a JUNIOR CLERK, in a Builder's Office. Must write a good hand, and be quick at figures. Hours, Six a.m. to Six p.m.—Address, A. B. Post-office, High-street, Camden-town.

WANTED, an intelligent YOUTH, who can DRAW and MAKE PLANS, make up wages accounts, and generally assist a Clerk of the Works on a Building Job.—Address, with particulars and terms, M. F. Pall-mall Club, S.W.

WANTED, immediately, for the Country, a WORKING FOREMAN of PAINTERS. Must be a good writer and grainer, decorator, &c. and competent to design and cut stencils.—Apply to Messrs. FARMILOE & SONS, 118, St. John's-street, West Smithfield, London.

WANTED, immediately, in London, a young and active YARD FOREMAN, to take entire charge of carmen, and the conversion of timber, &c. None but energetic persons, bearing, a good character, need apply, stating wages and references, to 98, Office of "The Builder." (By letter only.)

TO PLUMBERS.
WANTED, in the Country, a thorough good PLUMBER. Constant work to a suitable hand.—Address, stating wages and particulars, to 141, Office of "The Builder."

WANTED, in a Quantity Surveyor's Office, A good, sharp BOY, quick at figures.—Address, W. B. Messrs. Dinsdale & Co. Pancras-lane, E.C.

GENERAL JOINER.—WANTED, an experienced hand to work a General Joining and Planing Machine.—Apply at 108, St. Martin's-lane, W.C.

TO KENTISH RAG WALLERS, &c.
GOOD WORKMEN WANTED immediately.—Apply at St. John's Church, Reading, Berks.

FITTERS WANTED, Outdoor and Indoor.
WANTED immediately, by a provincial gas company, an experienced FITTER, capable of Fitting-up Boilers, Retort-house Works, Mains, and Service Laying. Also, a young Man as INDOOR FITTER, used to fitting-up works and large establishments in iron and compo tubing; and likewise a good METER REPAIRER and TINMAN. Good characters for industry and sobriety indispensable. State wages.—Address, 116, Office of "The Builder."

ENGRAVER'S PUPIL.—WANTED, an OUT-DOOR PUPIL, with decided talent for art, by a Wood Engraver engaged on the highest class of illustrated periodicals.—Apply to Mr. C. ROBERTS, 47, Fleet-street, E.C.

CLERK WANTED, who has a knowledge of Ironwork and Machinery, and is a quick tracer.—Address, stating experience and salary required, to L. care of Messrs. Dawson & Sons, 121, Cannon-street, E.C.

TO GLASS PAINTERS.
A FIRST-CLASS PAINTER WANTED. Also a GOOD LINER.—Apply to F. BARNETT, Edinburgh and Leith Stained Glass Works, Leith, N.B

A SURVEYOR is WANTED, for Estate Work. State experience and salary.—CORBETT & WOOD, High-street, Sheffield.

TO MASONS.
WANTED, EMPLOYMENT, by a young Man, aged 25. Is a good letter-cutter and mason.—Address, F. G. 32, Terrace-street, Gravesend, Kent.

WANTED, EMPLOYMENT, by an experienced PLUMBER, PAINTER, and GASFITTER. Country preferred.—Address, A. B. 49, Barley Mow-passage, Smithfield.

WANTED, an ENGAGEMENT, by a first-class GRAINER and good PLAIN WRITER. London preferred.—Address, T. SMITH, care of B. Young, 186, Vauxhall Bridge-road, Pimlico.

WANTED, an ENGAGEMENT, by an ARCHITECT'S ASSISTANT. Well up in design, working drawings, and details. Can work out perspectives, and colour artistically. Good reference.—Address, 70, Office of "The Builder."

TO ARCHITECTS AND SURVEYORS.
WANTED, an ENGAGEMENT, by a good DRAUGHTSMAN and COLOURIST. Well up in detail. Has had eight years' experience. Can send testimonials and specimens.—Address, F. 29, Alfred-street, Bedford-square, W.C.

WANTED, an ENGAGEMENT, as MANAGER, or ASSISTANT MANAGER, to a SURVEYOR or BUILDER, by a thorough practical person, of considerable experience in every branch of the building trade, drawing, estimating, bookkeeping, management of house property, surveying, dilapidations, and valuations. Excellent references.—Address, 74, Office of "The Builder."

TO SURVEYORS, ESTATE AGENTS, &c.
WANTED, an ENGAGEMENT, as MANAGING CLERK (or otherwise) over the Architectural and Surveying Department, or to render Occasional Assistance. Has had considerable experience in surveying, superintending building works, &c. Good references.—Address, S. O. I. Messrs. Deacon's, Leadenhall-street, E.C.

WANTED, a RE-ENGAGEMENT, by a thoroughly practical CLERK of WORKS. Can be well recommended.—Address, C. D. 6, Little St. James-street, Pall-mall.

WANTED, a RE-ENGAGEMENT, as CLERK of WORKS, or GENERAL FOREMAN. Good references.—Address, J. W. H. 1a, Princes-street, Marlborough-road, Chelsea, S.W.

TO ARCHITECTS AND SURVEYORS.
WANTED, a RE-ENGAGEMENT, by an ASSISTANT, in Town or country. Over twelve years' experience in London offices.—Good references. Salary, about 35*s.* per week.—Address, H. V. J. Messrs. Deacon's, Leadenhall-street, E.C.

TO BUILDERS.
WANTED, a RE-ENGAGEMENT, by a thoroughly efficient SHOP FOREMAN of JOINERS. Acquainted with the other branches, and good at quantities, estimates, and drawings.—Address, P. Q. R. Post-office, Twickenham.

TO BUILDERS AND CONTRACTORS.
WANTED, a RE-ENGAGEMENT, by a practical Man, as GENERAL OUT-DOOR WORKING FOREMAN, or Charge of Job. Carpenter and Joiner by trade. Good references from his late employer.—Address 7,073, Office of "The Builder."

WANTED, a RE-ENGAGEMENT, by a thoroughly practical GENERAL FOREMAN, to take the entire charge of a job. Town or country. Carpenter and Joiner by trade. Has had the management of extensive buildings in London. Good references.—Address, M. 169, Cambridge-street, Pimlico, S.W.

WANTED, a RE-ENGAGEMENT, as GENERAL MANAGER, in RAILWAY, SEWER, WATER, or PUBLIC BUILDINGS WORKS, with first-class references. Twenty-three years' experience. Country or abroad not objected to. —Address, H. 133, Fairfoot-road, Gamble-road, Bow, E.

TO BUILDERS AND CONTRACTORS.
WANTED, a RE-ENGAGEMENT in London, by a PRACTICAL MACHINIST, to work a general joiner, who has worked Worssam's, and Fowis & James's, &c. Good references. Joiner by trade. Age, 26.—Address, W. H. 29, Barclay-street, Oakley-square, N.W.

TO BUILDERS AND CONTRACTORS.

WANTED, a RE-ENGAGEMENT, as WORKING SHOP FOREMAN of JOINERS. References to firm just leaving.—Address, F. B. 6, Montpelier-street, Walworth-road, S.E.

TO BUILDERS AND CONTRACTORS.

WANTED, a RE-ENGAGEMENT, as SHOP or GENERAL FOREMAN. Good references. Joiner by trade.—Address, J. B. 2, Mulberry Villas, Wellington-road, Fulham, S.W.

WANTED, a SITUATION, in an Architect's Office, by the Advertiser, who has had considerable experience both in the designing and execution of buildings.—Address, J. B. Lambert, Brothers, Advertising Agents, Westbourne-grove.

WANTED, a SITUATION, by the Advertiser, a Man of practical experience, gained on large works and in the offices of leading London firms. Good surveyor and accountant. Thoroughly acquainted with the prime cost of labour and materials.—For further particulars, apply to No. 139, Office of "The Builder."

WANTED, a SITUATION as CLERK of WORKS, or Foreman on a gentleman's estate, or to take charge of a job. Well up in all branches, and understands felling and measuring timber. Middle aged. Married. First-class testimonial.—Address, N. 126, Abbey-street, Bermondsey, S.E.

TO BUILDERS, HOUSE DECORATORS, AND OTHERS.

WANTED, a SITUATION, by a good GRAINER and WRITER. Willing to fill up time painting and paperhanging. Understands gilding, embossing, stencilling, &c. Town or country.—Address, B. care of Mr. Rhodes, 3, King-street, Westminster.

TO BUILDERS AND BRICK, LIME, AND STONE MERCHANTS.

WANTED, by a competent Man, a SITUATION, in Town or Country, as CLERK, or in any position of Trust. Twelve years' reference in the Trade.—Address, J. L. 25, North-street, Cambridge Heath, N.E.

WANTED, by an energetic, steady Man, an OUTDOOR FOREMANSHIP, or to Take Lead of Carpenters. Good references.—Address, A. B. 4, Claremont-place, Stepney-green, E.

TO LIME AND CEMENT MERCHANTS, &c.

WANTED, by an energetic Gentleman, the MANAGEMENT of a BRANCH WHARF, or as Traveller and Collector, or any position requiring trust and confidence.—Address, W. P. R. Messrs. Deacon's, Leadenhall-street, E.C.

WANTED, by a thoroughly practical Man (Carpenter), a RE-ENGAGEMENT as FOREMAN or Clerk of Works. Well up in Gothic and ecclesiastical work. Aged 36.—Address, J. D. 7, Carburton-street, Great Portland-street, W.

WANTED, by a thoroughly practical Man, a SITUATION as GENERAL FOREMAN, CLERK of WORKS, or on a Gentleman's Estate. Great experience in Town and Country. Good reference. No objection to go abroad for any length of time.—Address, T. C. 3, Tabernacle-terrace, Burdett-road, Mile-end, London.

WANTED, by a thoroughly energetic and practical Man, a RE-ENGAGEMENT as GENERAL FOREMAN, or to take the Management of an Estate. Just completing extensive building operations in London. Seven years' good reference.—Address, A. B. Mr. Wood, 83, Newington-butts.

WANTED, by an experienced Man, a SITUATION as SHOP FOREMAN—a Joiner—would fill up his time at Bench; or to Take Charge of a Job in Town or Country; or to Take Charge of Building and Repairs on an Estate.—Address, L. J. F. 15, Wharf-road, Latimer-road, Notting-hill, W.

WANTED, by a good CARPENTER and JOINER, a CONSTANT SITUATION. Can do jobbing work if required. Would have no objection to working on an estate. Steady and respectable. Married. Aged 27.—Address, C. B. 54, Pool's Park, Seven Sisters-road, Holloway.

TO BUILDERS, PLUMBERS, AND OTHERS.

WANTED, by a good PLUMBER, a SITUATION or JOB.—Address, PLUMBER, 56, College-street West, Camden Town, London, N.W.

WANTED, by a respectable Man, a SITUATION as PLUMBER, &c. Constant or job. Aged 27. First-class references can be given if required.—Address, H. W. No. 19, Queen's-gardens, Brompton-road, S.W.

WANTED, by the Advertiser, a Position as JUNIOR CLERK. Experienced in prime cost. Twenty-five years of age. Good references.—Address, M.F. 27, Haberdasher-street, Hoxton.

TO BUILDERS AND CONTRACTORS.

WANTED, by the Advertiser, a SITUATION as BUILDER'S CLERK. Used to taking off quantities, measuring up, and billing. Well up in construction. Thoroughly competent from practical experience. Unexceptionable references both as to ability and respectability.—Address, in first instance, to 138, Office of "The Builder."

TO BUILDERS AND DECORATORS.

WANTED, by a young Man, aged 19, a SITUATION in an Office. Thoroughly understands keeping books and the general routine of office duties, and has a knowledge of drawing and estimating.—Address, 91, Office of "The Builder."

TO PLUMBERS, BUILDERS, AND OTHERS.

WANTED, by a young Man, a SITUATION. Is a thoroughly practical PLUMBER, and is well up in the other branches of the trade. Good references if required.—Address, A. B. 120, Bridge-road, Battersea, S.W.

TO TIMBER MERCHANTS.

WANTED, by a young Man, aged 34, a SITUATION in the English Timber Trade. Has a thorough knowledge of buying, selling, and connecting. Good references. No objection to the country.—Address, X. Y. 9a, Cambridge-circus, Hackney-road.

TO BUILDERS, BREWERS, &c.

WANTED, by a young Man, a CONSTANCY, as SIGN WRITER and GRAINER. No objection to fill up time with painting. Four years writer to a brewery and understands every branch. Wages moderate.—Address, A. H. 6, St. John's-terrace, Walham-green, Fulham, S.W.

WANTED, by a steady young Man, a SITUATION as IMPROVER to the WRITING and GRAINING.—Address, J. P. 24, Bedford-street, Bedford-row, High Holborn.

TO BUILDERS AND OTHERS.

WANTED, by a steady, experienced Man, a SITUATION as FOREMAN of PAINTERS. Is a good grainer. Has been as above eighteen years. Unexceptionable testimonials. Town or country.—Address, A. B. 7, Denmark-road, Kilburn.

TO BUILDERS AND HOUSE DECORATORS.

WANTED, by a steady and thoroughly practical PAPERHANGER, WORK by the PIECE, or would not object to a permanent situation, to fill up time in painting. First-class reference.—Address, J. S. 21, Canterbury-road, Ball's Pond-road, Kingsland.

TO SURVEYORS.

WANTED, by a first-class DRAUGHTSMAN and SURVEYOR, a RE-ENGAGEMENT. Country preferred. Thirteen years' experience in a London Surveyor's office with extensive practice. — Address, A. B. care of Wilson, Stationer, Delancey-street, Camden-town.

TO BUILDERS, CONTRACTORS, AND OTHERS.

WANTED, by an energetic middle-aged Man, a SITUATION as GATE TIMEKEEPER, BRICK TALLYMAN, or any Place of Trust. Has been with a builder eight years. Good reference from same. Security if required.—C. A. No. 112, Euston-road, N.W.

WANTED, by a practical Man, a SITUATION as FOREMAN, in Town or country. Carpenter and Joiner by trade. Good references from last employer.—Address, A. E. S. 612, Old Kent-road, S.E.

TO JOBBING MASTERS AND OTHERS.

WANTED, by a JOBBING CARPENTER, who is a good painter and paperhanger, a RE-ENGAGEMENT as GENERAL JOBBING HAND in all branches of House-repairs, Bricklaying, Masonry, Zinc-working, &c.—Address, S. S. No. 4, Carlisle-street, Soho, W.

WANTED, by a good STAIRCASE-HAND. WORK, where a constancy is likely. Would not object to stairs and rails by the piece, labour only. Good references.—Address, J. HALL, Elm House, Upper Mitcham, S.

WANTED, PLASTERING (Piece-work), by a Man in the habit of taking plastering to any amount. No objection to the country. Labour only.—Address, No. 107, Office of "The Builder."

WANTED, CARPENTER'S and JOINER'S WORK of any description by the piece. Any quantity taken; labour only; town or country.—Address, W. No. 13, Lower Calthorpe-street, Gray's Inn-road, W.C.

TO BUILDERS, CONTRACTORS, AND OTHERS.

WANTED, BRICKWORK or POINTING, by the PIECE, or a SITUATION as FOREMAN of BRICKLAYERS, by a thoroughly practical Man. Well acquainted with drawings and setting out works. Good references.—Address, A. B. 33, Grove-road, Upper Holloway, N.

TO HORTICULTURAL BUILDERS.

SITUATION WANTED, by a young Man, who for the last two years has been JUNIOR DRAUGHTSMAN in a large Firm of above. Full particulars on application.—Address, G. 5, Prospect-terrace, Britannia-road, Fulham-road, S.W.

TO LAND SURVEYORS, ESTATE AGENTS, AND OTHERS.

THE Advertiser, who is quick and neat at TRACING and MAKING PLANS, seeks an ENGAGEMENT in an Office of the above.—Address, No. 117, Office of "The Builder."

TO ARCHITECTS, SURVEYORS, AND BUILDERS.

THE Advertiser desires a RE-ENGAGEMENT as JUNIOR ASSISTANT in Town. Good reference; specimen shown.—Address, W. H. C. 24, Cock-lane, West Smithfield.

TO BUILDERS, PLUMBERS, &c.

THE Advertiser, a really good and experienced PLUMBER, wishes for a constant SITUATION as Plumber, Gas and Hot Water Fitter, and Zinc-worker; every description of bath, closet, and pump work; well up in first-class jobbing. Good references if required.—Address, J. B. 199, Vauxhall Bridge-road, Pimlico, S.W.

TO BUILDERS AND CONTRACTORS.

THE Advertiser, aged 23, seeks a RE-ENGAGEMENT. Has served four years at bench and three years in builders' offices and on works. Good references.—Address, T. L. No. 34, Antill-road, Bow, London, E.

TO ARCHITECTS.

THE Advertiser, aged 17, a good plain and ornamental DRAUGHTSMAN, seeks an ENGAGEMENT in Town. Active employment of greater consideration than pecuniary remuneration.—Address, 5, Elm-villas, Rye-lane, Peckham.

SAW-MILLS. — EMPLOYMENT WANTED, to WORK FRAME or BENCH.—Address, A. B. No. 16, Elliott's-row, St. George's-road, Southwark.

QUANTITY SURVEYOR and MEASURER, of upwards of twenty years' experience, offers ASSISTANCE (Temporary). — Address, QUANTITY SURVEYOR, 8, Mostyn-road, Brixton-road, S.W.

TO TIMBER MERCHANTS.

K. A. B. seeks a RE-ENGAGEMENT, as TRAVELLER in a Timber Merchant's Office. Has a good connexion among the London trade, and a thorough knowledge of timber. Unexceptionable references.—Address, at C. H. May's, 78, Gracechurch-street, E.C.

ENGINE-DRIVER wants a SITUATION. Builder's Plant or Charge of Waterworks. Good references. Five years in last place.—Address, ENGINEER, 29, Shrubland-road, Dalston.

FOREIGN TIMBER TRADE, &c.—A Gentleman desires RE-ENGAGEMENT. References and testimonials to integrity and competency, of the highest order.—Address, first, M. care of Mr. Stanford, 6 & 7, Charing-cross, S.W.

CLERK of WORKS.—A thoroughly practical and experienced Man, is open to an immediate RE-ENGAGEMENT, having just completed a gigantic concrete building in the north. No objection to a similar engagement. References and testimonials first-class.—Address, THOMAS STAFFORD, 59, Caroline-street, Nottingham.

CARPENTER, aged 21, WANTS a SITUATION as IMPROVER.—Address, A. 117, Great Suffolk-street, Borough.

A PRIME-COST CLERK requires a RE-ENGAGEMENT. Highly satisfactory references. Salary moderate.—Address, 75, Office of "The Builder."

TO BUILDERS.

AN experienced ESTIMATING CLERK, &c. desires an ENGAGEMENT. Well up in day and measured accounts. Used to the supervision of men.—Address, W. Avenue Cottage, Manbey-road, Stratford, E.

AS CLERK of WORKS, an experienced Man in all branches of the Building trades, having completed a job for an eminent London Architect, desires a RE-ENGAGEMENT. Either Town or Country. Well up in Gothic. Testimonials of the highest character.—Address, A. B. 8, Kennington Oval, London.

A RE-ENGAGEMENT WANTED, as GENERAL FOREMAN in Charge of a Job. Town or country. Carpenter. Aged 38.—Address, F. A. 19, York-road, Lambeth, S.E.

A FIRST-CLASS GRAINER is open to a JOB.—Address, B. YOUNG, 186, Vauxhall Bridge-road, Pimlico.

A JOINER (27) WANTS a JOB at the bench, and to assist in the office to prepare plans. Is a quick tracer. Town or country.—Address, 136, Office of "The Builder."

AN experienced JOINER WANTS a JOB. Piecework preferred.—Address, A. B. 18, Swinton-street, Gray's-inn-road.

TO ARCHITECTS, &c.

AN ASSISTANT, thoroughly experienced in design, preparing working drawings, specifications, and estimates, is open to an ENGAGEMENT.—Address, No. 124, Office of "The Builder."

TO ARCHITECTS.

A GOOD GENERAL ASSISTANT, of eighteen years' experience, desires an ENGAGEMENT. Is a first-class Gothic draughtsman and designer, and has also been employed as clerk of works. The management of an office preferred. Address, S. S. 7, Sydney-terrace, Portland-place, South Lambeth.

TO ARCHITECTS, SURVEYORS, AND BUILDERS.

A QUICK DRAUGHTSMAN and TRACER requires an ENGAGEMENT.—Address, J. T. 30, Acacia-grove, Croxted-road, West Dulwich.

A THOROUGHLY practical and experienced DRAUGHTSMAN, undertakes Working Drawings and Perspectives, is open to an ENGAGEMENT.—Address, B. W. Post-office, Barbican, E.C.

A PERSPECTIVE DRAUGHTSMAN WANTED, to PREPARE PEN and INK DRAWINGS, of Classic and Gothic buildings. Must understand, and be competent to treat details artistically. Engagement may be advantageous and permanent.—Specimens and terms to be sent to W. H. BRAKSPEAR, Architect, 98, Albert-square, Manchester.

A GOOD and expeditious DRAUGHTSMAN, who is perfectly capable of getting up working and finished drawings, perspectives, &c.; is a good colourist, and understands the routine of an office, is desirous of meeting with an ENGAGEMENT. Terms moderate.—Address, C. R. Maritime Cottage, Elm-grove, Peckham.

TO ARCHITECTS.

A FIRST-CLASS DRAUGHTSMAN and experienced Architectural Assistant is at present disengaged. Well up in design, perspective, and colouring, and considerable experience in competition work.—Address, ARCHITECT, 143, Warwick-street, Warwick-square, S.W.

AS FOREMAN or CLERK of WORKS. A JOINER, accustomed to drawing, desires a SITUATION as above.—Address, 10, Post-office, New Wandsworth.

A YOUNG MAN is in want of a SITUATION as THREE-BRANCH HAND.—Address to W. K. 5, Boston-place, Dorset-square, Marylebone, W.

TO LIME-BURNERS. — FOR SALE, 14 acres of LAND, with an inexhaustible supply of fine chalk, within ten minutes of a town and railway station, 50 miles from London.—Apply to NEWSON, STANLEY, & CO. 2, Walbrook, E.C.

TO BRICKMAKERS. — TO BE LET, KENT HOUSE BRICKFIELD, with Plant. — Apply to Mr. LANGLAND'S, Kent House Farm, Penge, S.E.

CHILTON BRICK and LIME WORKS, SUDBURY, SUFFOLK.—TO BE LET, or SOLD, these FREEHOLD WORKS, well known as supplying the London and local markets with best white and red Suffolk facings and moulded bricks, including a large quantity of earth prepared for next year's working. For particulars, apply to Mr. W. KIRBY, Christopher Hotel, Sudbury, Suffolk; Mr. G. COOTE, Auctioneer, Sudbury; or Messrs. WATSON & SONS, Solicitors, 12, Bouverie-street, London, E.C.

TIMBER-YARD, CURTAIN-ROAD. — TO BE LET, a spacious TIMBER YARD, having an area of about 7,200 square feet, with timber stages, saw-pit, and counting-house.—Apply to Messrs. FULLER, HORSEY, SON, & CO. 11, Billiter-square, E.C.

HOWITT'S PATENT TUBULAR ROOF WORKS.—To ENGINEERS, HORTICULTURAL and other BUILDERS.—TO BE SOLD, or LET, with immediate possession, a handsome WORKSHOP, with machinery, tools, and general stock, and all appliances for the manufacture of the Patent Horticultural Tubular Roofs and Buildings, "on Howitt's principle," which obtained the Gold Medal at Birmingham, June 25, 1872. Good and satisfactory reasons given for the present proprietor retiring from the business. The above to be disposed of on very reasonable and easy terms. This is a first-rate opportunity for one requiring a good business with a small capital.—For further information and particulars, apply to WILLIAM HOWITT, Horticultural Builder, Ilford, Essex.

TO CAPITALISTS.—PATENT ENCAUSTIC and GEOMETRICAL FLOOR TILE WORKS.—FOR DISPOSAL, a well-established BUSINESS, with Freehold Manufactory replete with every conveniences. Excellent machinery, nearly new, including all modern appliances. Eligibly situated in the centre of Staffordshire potteries. The works are in full operation, and the business is capable of considerable extension.—For particulars, apply to Messrs. S. HAYES & CO. Accountants, Hanley, Staffordshire.

TO CONTRACTORS, BUILDERS, and OTHERS requiring SPACE and STEAM POWER.—TO LET, near Fulham, good STABLING, SHEDS, and large WORKSHOPS, fitted up with 7 H.P. steam-engine, boiler, &c. in working order. Also, adjoining, an Eight-roomed convenient DWELLING-HOUSE. The whole to be let together or separately, with or without the steam-engine, &c.—Apply to J. EVANS, 18, Old Compton-street, Soho, W.

TO BUILDERS and DECORATORS.—A GASFITTER and PLUMBER'S BUSINESS FOR SALE, with Leases of Premises, in the N.W. district.—Apply to H. C. 30, Great College-street, Westminster.

BUILDER'S Old-established genuine BUSINESS, in full trade, FOR DISPOSAL, in the best position in a large market town in Kent. Excellent house, commodious workshops, the entire plant, stabling, and every convenience for carrying on an extensive business. Valuation, about 600*l.* Rent, only 40*l.*

Mr. WICKENDEN, 37, Parade, Tunbridge Wells.

TO BUILDERS and CONTRACTORS.— An Old-established BUSINESS TO BE DISPOSED OF, with considerable advantage. All branches employed, and Proprietor will assist for two or three years if required. Stock and goodwill about 2,000*l.*, but may be reduced, and part of payment can remain. To an energetic, enterprising man a better opportunity cannot be offered.—Apply, in first instance, to A. Z. General Post-office, Birmingham.

TO BUILDERS and OTHERS. — The LEASE TO BE SOLD of an old-established BUILDER'S PREMISES, consisting of yard, workshop, stable, office, and dwelling. Same hands thirty years.—Apply to THOS. NASH, Builder, Leather-lane, Holborn.

TO TIMBER MERCHANTS and OTHERS. TO BE DISPOSED OF, a TIMBER BUSINESS and SAW-MILLS, well situated for trade. The business has been established for many years, and is now doing a large and profitable trade. Arrangements can be made that this business may be taken with a very small capital.—For particulars in first instance apply, by letter, to A. B. care of Messrs. Dawson & Sons, 121, Cannon-street, London, E.C.

JOBBING BUILDER'S BUSINESS for DISPOSAL.—Old-established, premises rent free, contracts and work going on, with plant, &c. Satisfactory reasons for disposal.—Apply to Mr. DALLOR, 7, Charlotte-street, Blackfriars-road.

BUILDER and DECORATOR'S BUSINESS FOR DISPOSAL. Returns about 2,000*l.* per annum. Situate W.C. Small premium for Lease and Goodwill. Stock and Plant at valuation.—Apply at Mr. JOHN WEIGHT'S Paper Warehouse, High-street, Camden-town, N.W.